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DEPARTMENT OF NATURAL RESOURCES
MARYLAND GEOLOGICAL SURVEY
DIVISION OF ARCHEOLOGY

FILE REPORT NUMBER 217

ARCHEOLOGICAL DATA RECOVERY AT A NINETEENTH CENTURY IRON WORKERS' DWELLING AT HARFORD FURNACE, MARYLAND

by

SILAS D. HURRY

Report submitted to the Maryland State Highway Administration
Project No. H 836-201-480

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MARYLAND STATE HIGHWAY ADMINISTRATION
PROJECT PLANNING DIVISION
ENVIRONMENTAL EVALUATION SECTION

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Maryland Geological Survey

ABSTRACT

Archeological investigation at the Harford Furnace site resulted in the discovery of a 19th century domicile occupied by industrial workers. The structure was a two-celled center-chimneyed "duplex". Associated with the structure were numerous features including fence lines, drainage ditches, planting holes, and a privy. Additionally, a trash-filled relict creek bed adjacent to the structure provided a large array of well-preserved domestic debris. Chronological analysis and historic research place the site in the time period 1830 to 1880. Analysis of ceramic vessels suggests that the occupants of the site had considerable disposable income which was used to purchase portable goods. This is interpreted as being a function of the occupants' involvement in a wage economy as transient laborers who eventually saved sufficient funds to move elsewhere, acquire land, and shift their professional focus to agricultural pursuits.

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ACKNOWLEDGMENTS

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Thomas Struthers and Michael Parrington of John Milner Associates kindly shared their research on the site which had been undertaken in the preceding spring. Garrow and Associates of Atlanta, Georgia, allowed us to use and modify their computer-based artifact cataloging system. Mr. David Smith, an adjacent landowner, provided us with his knowledge of the site and shared photographs of the principal furnace complex. His nephew, Everett Smith, assisted by sharing his previous historic research on the furnace. Many other local individuals visited the site in the process of excavation and freely shared their knowledge of the area. Special thanks must go to Ms. Mary Chairs of Harford Community College who greatly assisted our efforts by obtaining permission to use their facilities as a field lab.

Dr. Timothy Riordan of the St. Mary's City Commission assisted with the identification of specific transfer print patterns on English refined earthenwares. Dr. Henry Miller of the St. Mary's City Commission provided information on early iron manufacturing in Maryland and assisted with artifact identification. Orlando Ridout V of the Maryland Historical Trust kindly shared his knowledge of architecture as it applied to structures related to industrial sites. Beth Ford of Historic Annapolis assisted by providing information on leather conservation. Kristin Koveleski, a title search specialist in Baltimore City, helped explain some of the knotty problems in researching the Harford Furnace property chain of title. George Miller of the Colonial Williamsburg Foundation assisted in the button and ceramic analyses by sharing his unique knowledge. Charles Fithian of Delaware's Island Field Museum put us in contact with Albert Saguta who undertook the analysis of the shoes recovered from the excavations. Helen Cox, Conservator of the Baltimore Center for Urban Archeology, provided information on the initial treatment and recordation of the leather recovered. Robert Conkwright of the Coastal and Estuarine Geology Program, Maryland Geological Survey, assisted in the analysis of the buttons recovered by providing access to and expertise with the x-ray diffractometer and the assessment of specific gravity. Darlene Wells of the Coastal and Estuarine Geology Program, Maryland Geological Survey, arranged through Gabriel Donovan of the Johns Hopkins Hospital the use of xeroradiographic equipment to analyze the buttons. Bryon Sudbury assisted in providing additional information for the tobacco pipe research. John McGrain, Executive Secretary of the Baltimore County Landmarks Preservation Commission, kindly discussed historical questions in the course of the research and reviewed the historic sections of this report.

Hettie Boyce, Jennifer Chapman, Stephanie Crockett, Katherine Dinnel, Timothy Doyle, Spencer Geasey, Janet Gillis, Jonathan Greene, Alison Helms, William Huser, Betty Leigh Hutcheson, Camille Juliana, and Timothy Sara served as field assistants. Maureen Kavanagh was co-principal investigator in the field and helped make critical decisions on laboratory matters. Lori Frye coordinated laboratory operations as field work was proceeding. Ms. Boyce, Ms. Crockett, Ms.

Dinnel, Mr. Doyle, Ms. Helms, and Ms. Hutcheson continued with the project during the laboratory phase. Ms. Crockett, Ms. Dinnel, Ms. Helms, Mr. Doyle, Ms. Hutcheson, and Ronald G. Orr assisted in undertaking artifact analyses. Carol Ebright, Alison Helms, William Huser, and Betty Leigh Hutcheson produced the illustrations for the report while Ms. Helms also assisted in the historic research. Sincere appreciation goes to Elizabeth Winterstein for her diligent efforts in typing the many corrections and revisions of the text. Special thanks must go to Tyler Bastian, Ira Beckerman, Maureen Kavanagh, Elizabeth Cole, and Dennis C. Curry for their helpful reviews and contributions to this study.

SDH

INTRODUCTION

The Phase III (Data Recovery) project at the Harford Furnace site was undertaken by the Division of Archeology, Maryland Geological Survey in the summer of 1985. The project was funded by the Maryland State Highway Administration as part of a series of studies investigating the proposed impact area of a replacement bridge for Maryland Route 543 over James Run in Harford County, Maryland, in compliance with Section 106 of the National Historic Preservation Act, as amended. Material and records resulting from this study are the property of the Maryland State Highway Administration and are curated by the Maryland Historical Trust.

The report is divided into a number of distinct sections. Initially the physical setting of the site is described as it relates to both historic and prehistoric settlement followed by a discussion of previous archeological research at the site. The current research design, a detailed historical overview, and a site-specific history of the research area are presented along with a description of field methods and techniques. The findings of the fieldwork are presented with a discussion of the results of the sampling strategy and the findings of the large areal excavations. The historical and archeological data are combined with the artifactual analyses to suggest hypotheses, assess occupant wealth, and forward conclusions. Finally, based on these considerations, an assessment of site significance is provided. Additional, specific artifactual analyses are addressed in appendices.

ENVIRONMENTAL SETTING

The Harford Furnace site is located adjacent to Maryland Route 543 just north of the crossing of James Run in Harford County, Maryland (Figure 1) at an elevation of roughly 24 m above sea level. The site is near the border of the Western Shore division of the Coastal Plain physiographic province and the Piedmont, within Maryland Archeological Research Unit 6 (Figure 2). A major portion of the research area is located in the floodplain of James Run near the Fall Line. Soils present are the Codorus series, alluvially deposited silt loams, which undergo frequent inundation and have a primary vegetation association of hydrophitic mixed hardwoods, with an understory of greenbrier, honeysuckle, and Virginia creeper. The soils are described as only marginally suitable for agriculture due to drainage problems (Smith and Matthews 1975:20-21).

A location near the Fall Line on James Run was ideally situated for the development of a charcoal-fired iron furnace. Nearby deposits of iron ore, a ready supply of wood for charcoal, and access to navigable water for sea transport of the finished product, all contributed to the establishment of an iron furnace in this locale. Location near the Fall Line allowed for the capture of hydraulic energy to turn the wheel which pumped the bellows to power the blast. Oyster shell was in ready supply to be used as flux for the separation of molten iron from slag. Given the extreme weight of the finished product, sea transport of the iron was desirable. For all of these reasons, the floodplain of James Run provided a perfect location for a charcoal-fired iron furnace.

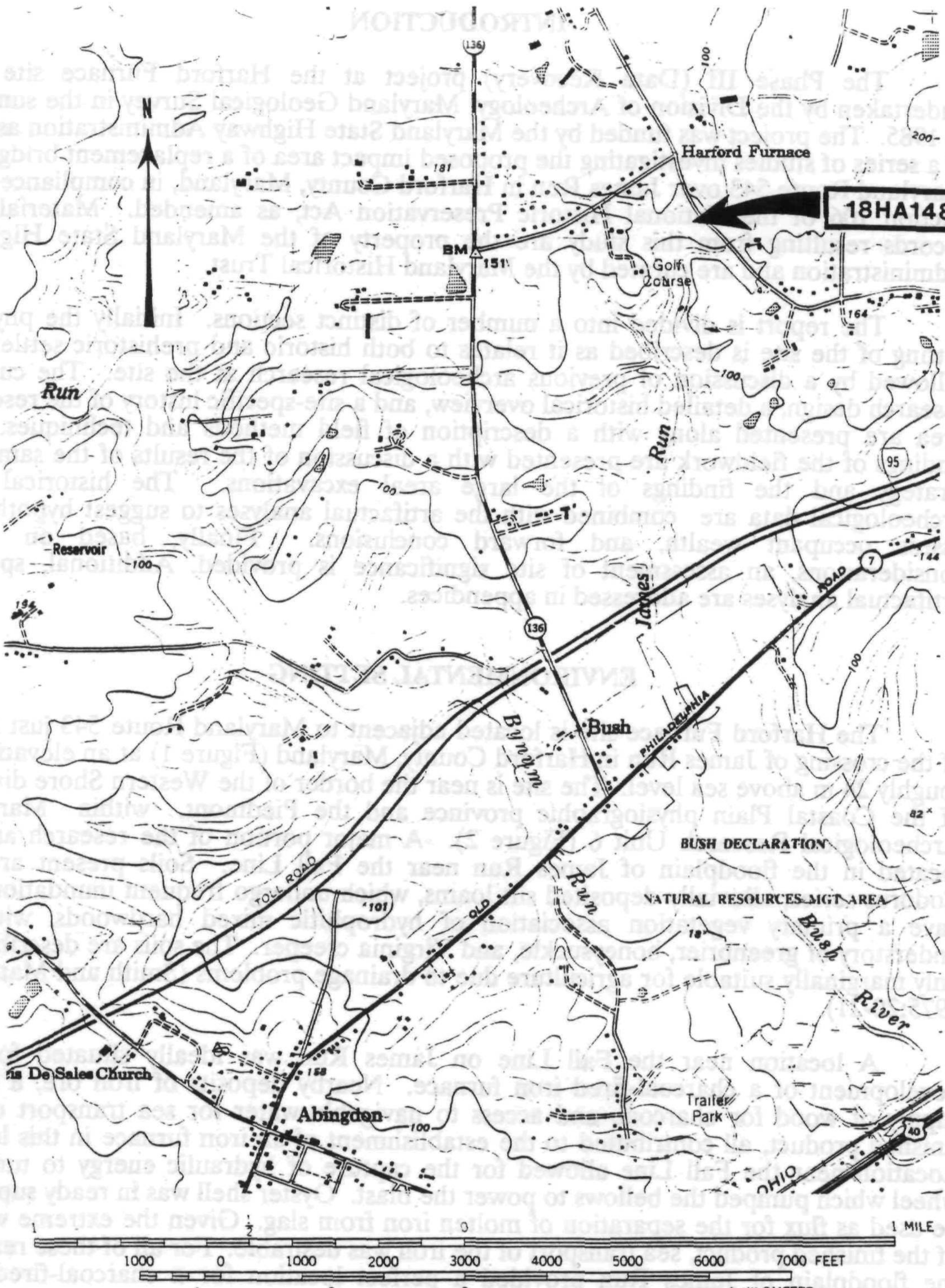


FIGURE 1. Location of site on 1985 Edgewood 7.5 minute quadrangle.

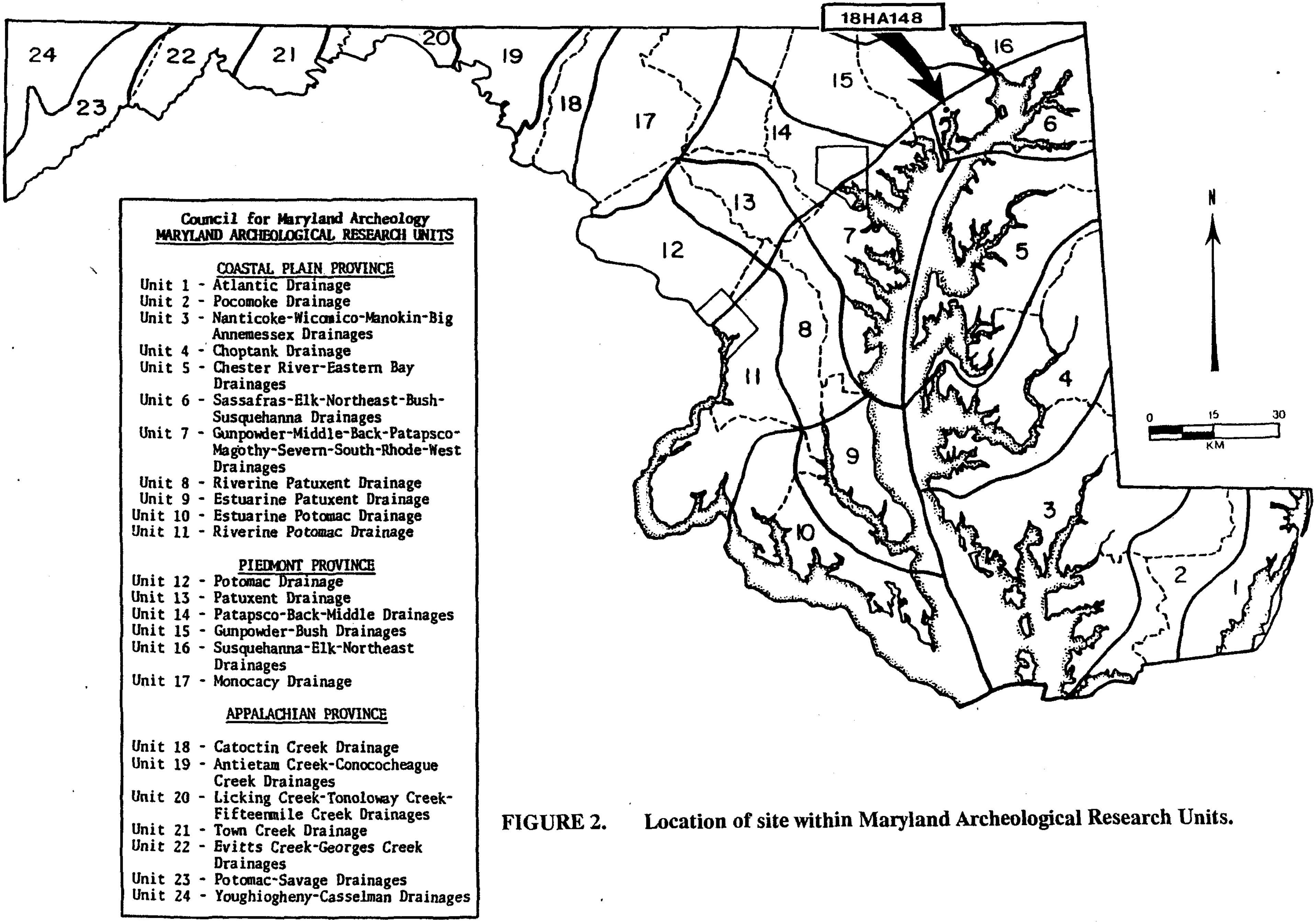


FIGURE 2. Location of site within Maryland Archeological Research Units.

PREHISTORIC SITE POTENTIAL

Prehistoric occupation of the Middle Atlantic region dates from at least 10,000 years ago, evidenced by the presence of characteristic fluted points (Brown 1979). While there are no predictive models for prehistoric site locations available for this specific area, the general regional settlement pattern would suggest that the area would have low to moderate potential for prehistoric sites, given its location immediately adjacent to James Run (positive factor) in frequently inundated soils (negative factor). (Prehistoric material recovered in the course of the excavations is described and summarized in Appendix I).

PREVIOUS RESEARCH

The research area was first archeologically investigated by Maureen Kavanagh, Division of Archeology, Maryland Geological Survey, under the auspices of the Maryland State Highway Administration in July of 1982 (Kavanagh 1983:8). Construction plans at that time called for impacting a relatively small (25 m by 130 m) triangular parcel adjacent to Maryland Route 543 near James Run. Based on shovel test pits, Kavanagh defined an area of domestic debris adjacent to, and west of, Maryland Route 543 near James Run. The artifacts recovered included 19th century ceramics (pearlware and whiteware), clay pipe stems, iron nails, plaster/mortar, and slag. Based on this material, and map research relating the area to the Harford Furnace complex, Kavanagh suggested protective fencing and archeological monitoring to safeguard the cultural resources present (p. 12).

In the spring of 1985, John Milner Associates, Inc., executed an intensive Phase II site assessment under the direction of Michael Parrington and William Henry (Parrington 1985:22). Due to engineering modifications, the impact area had been redesigned to include a corridor nearly 70 m wide and 375 m long. The research methods utilized in this preliminary site examination involved historic research, clearing and pedestrian reconnaissance, systematic shovel test pitting, controlled unit excavation, and mechanical excavation (p. 22-24).

The shovel test pit strategy utilized a 5 m interval and extended from James Run to Goat Hill Road (Figure 3). Based on artifact density, an area of approximately 900 m^2 with a concentration of domestic and architectural debris was delineated as Area 1 (Parrington 1985:25) (Figure 3). To further examine Area 1, 13 controlled test unit excavations were undertaken. Four of these test units revealed cultural features. The features included postholes and an extensive area of compact, strong brown sand flecked with charcoal. The postholes were interpreted as representing the remains of a structure which "may in fact be some of the worker's houses which are documented at Harford Furnace" (Parrington 1985:47).

East of Maryland Route 543, Parrington identified the remnants of a former headrace which provided the water to power the blast for the furnace (Area 2)(p. 24). A stratigraphic cut through the raceway revealed three soil layers, but no artifacts other than slag were recovered. A stone retaining wall, north of the raceway and below a standing structure thought to be the company store for the furnace complex, was cleared of brush and its location mapped (Area 3) (p. 27). North of Area 1 and outside of the limits of proposed impact, the remains of a structural foundation were identified (Area 4). Some 19th century artifacts were associated with this structure, but comprehensive testing was not undertaken since it was beyond the limits of the proposed impact (p. 28, 48). East of Maryland Route 543 and adjacent to James Run the investigators identified a large area of modern domestic debris (Area 5). Shovel test pits were excavated north and east of the concentration and a representative sample of artifacts was retained (p. 28).

Based on the findings of the fieldwork, Parrington evaluated the resources present and made recommendations for additional work in each of the above-described areas. Area 1, with its possible structural remains and high concentration of artifacts, is described as "relevant to understanding the lifestyle and foodways of the individuals who lived and worked at Harford Furnace" (Parrington 1985:46). To this end "a comprehensive data recovery program" was recommended for Area 1 with "detailed studies of artifactual and faunal remains . . . and a program of metallurgical analysis" (p. 51). Area 2, the remains of the race, is described as having "the potential to further define the hydraulic system and engineering features of Harford Furnace" (p. 48). Parrington recommended detailed cartographic recordation and further excavations through this feature (p. 51). Area 3, the retaining wall, is described as defining the property's historic spatial organization, and careful cartographic recordation was recommended (p. 48, 51). While considered a significant resource, the structural remains in Area 4 are outside of the impact area and therefore no additional work was recommended (p. 48, 50). Area 5 was found to be of modern origin and therefore not significant, so no additional work was recommended (p. 45). In sum, extensive data recovery was recommended for Area 1 and careful cartographic and photographic documentation was recommended for Areas 2 and 3.

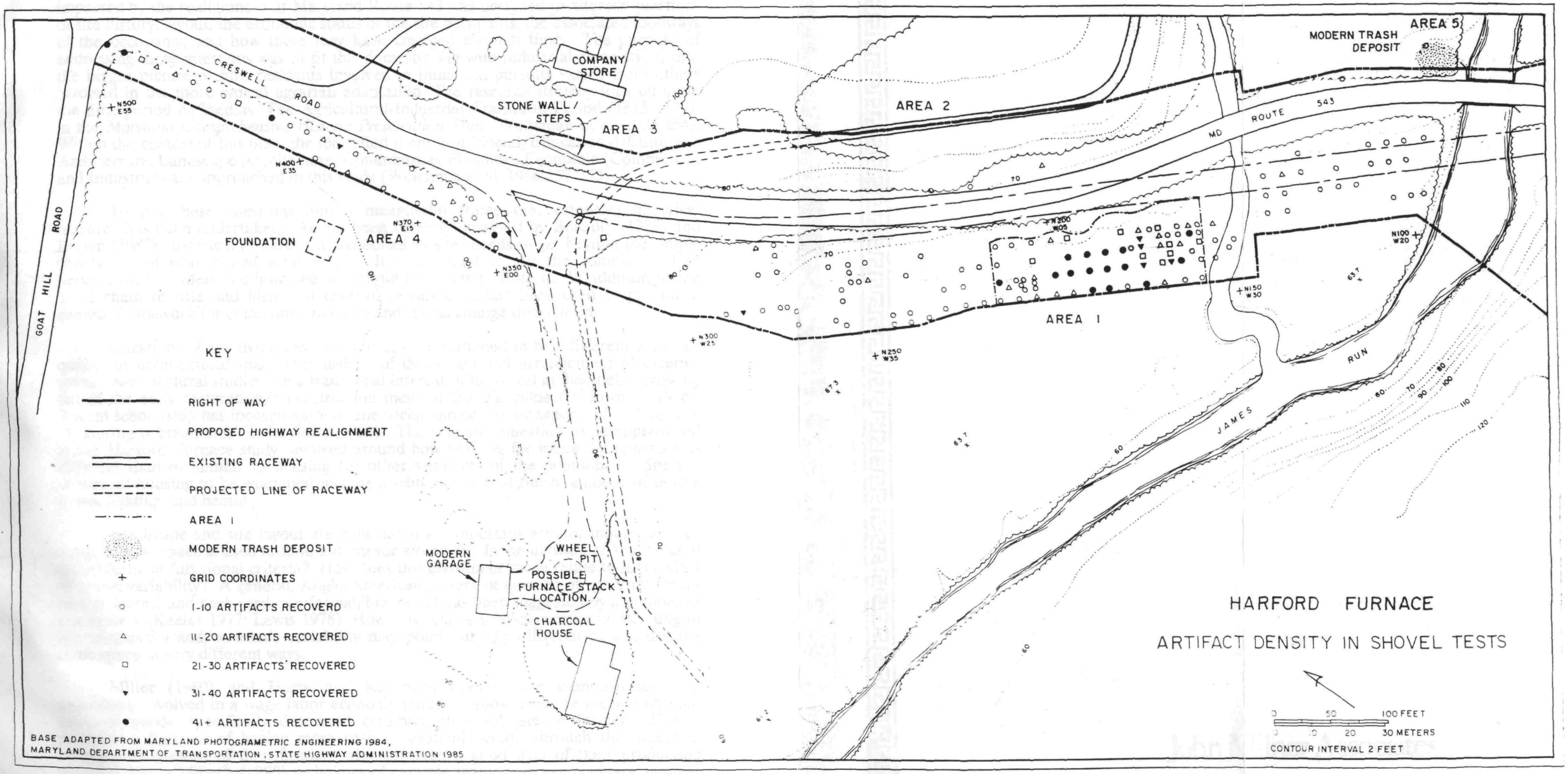


FIGURE 3. **Location of Phase II testing by John Milner Associates (Parrington 1985:Figure 8).**

CURRENT RESEARCH DESIGN

The data retrieval program at the portion of the Harford Furnace site to be impacted by the realignment of Maryland Route 543 was designed to address questions of site history, layout, the economic status of the site occupants, the associated foodways of the occupants, and how these may have changed through time. The purpose of addressing these questions was to fit this domestic site with industrial associations into the bigger picture of how residents involved in industrial pursuits varied from others involved in the more typical agrarian adaptation. The research strategy focused upon the time period defined as "The Agricultural-Industrial Transition Period (1815-1870)" in the *Maryland Comprehensive Historic Preservation Plan* (Weissman et al. 1986:254). Within the context of this plan, the identified themes of "Social/Educational/Cultural... Architecture, Landscape Architecture, Commmunity Planning...Economic (Commercial and Industrial) are approached in this study (Weissman et al. 1986:257-258).

To put these questions into a meaningful framework, extensive historical research has been undertaken. As has been recently observed by Beaudry (1987) and Brown (1987), historical research on archeological sites needs to get beyond the simple statements of who owned what when. It is essential to put the community into perspective to understand how one household functioned within it. In addition to the usual chain of title and historical context, census data has been used to provide a general framework for community makeup and reveal change through time.

Questions of the living environment can be examined in two different areas as: quality of architectural space (the insides of dwellings) and arrangement of exterior space. Architectural studies are a traditional interest of historical archeologists growing out of the early restoration/reconstruction focus of the discipline (cf. Forman 1986). Recent scholarship has focused more on the social and economic aspects of architecture as housing (Carson et al. 1981; Stone 1982). The principal question to be approached in the Harford Furnace study revolved around how housing for industrial tenants was different than or similar to housing for other segments of the population. Specific aspects of housing to be examined include quality of internal finish, amount of usable space, lighting, and heating.

Landscape and site layout are considered an important area of inquiry as they relate to how space is used around a domestic structure. Is the division of space based on aesthetic or functional criteria? How does this division of space relate to social class or ethnic variability? A general, Anglo-American pattern of division of space into front yard = formal and back yard = informal/functional has been suggested by a number of researchers (Keeler 1977; Lewis 1978). How this relates to socio-economic standing in the community and/or ethnic variability may point out why different people use the same space in very different ways.

Miller (1980) and Hurry and Kavanagh (1983) have demonstrated that individuals involved in a wage labor economy tend to dispose of more income on non-essential goods, specifically decorated ceramics, than subsistence farmers. This is probably a function of having more cash or available credit through the industrial company to dispose of than farmers who consume a good deal of their production directly. Using Miller's (1980) technique of ceramic scaling, we can compare samples from different time periods and different economic groups to define how economic status relates to economic pursuits. Specifically, is the material culture of landless industrial tenants comparable to agrarian tenants?

Foodways studies in the past have tended to dwell on ethnic variability in diet (Deetz 1977:152-153), adaptation of traditional foodways to new environments (Miller 1984), and general questions of seasonality and foodstuff procurement (Clark 1954). The focus of the Harford Furnace research will be to establish the diet and procurement strategies of industrial workers. Identification of individual species eaten and the range of elements will indicate the procurment strategy, i.e., on-site butchery or purchase of specific cuts of meat. Comparison with other assemblages will shed light on whether being a wage-laborer improves or denigrates one's diet. The same questions will be addressed through the floral analysis; however, due to difficulties in preservation, the observations will be much more limited.

In order to address all the above-described research questions it is necessary to undertake traditional chronological analysis. Particularistic descriptive analysis is the backbone of any diachronic research. It is essential to be able to sort out components, even on a short-term historic site, in order to observe change through time. For this reason, considerable weight will be given in the artifact analyses to providing temporal divisions within the site's occupation.

Working from a community-based historic framework, the economic status and associated foodways of industrial workers will be examined through time to better outline how industrial workers differed from their agrarian neighbors. These industrial workers' use of space around their domicile will be outlined and contrasted with patterns observed on historic sites elsewhere. Finally, these various strands of research will be integrated to outline a model of how the material culture of industrial workers in a rural setting differed from the typical agrarian rural setting.

As noted within the discussion of previous research (above), one of the recommendations by the archeologists with John Milner Associates was to undertake metallurgical analysis with material recovered from Harford Furnace. However, it became clear as excavations proceeded (see below) that it was not feasible to determine primary deposition of slag or casting waste within the limited area of domestic occupation under examination. Both slag and casting waste appear to have been redeposited and redeposited again by the occupants of the site. Without securely dated context with provable primary deposition, such metallurgical analysis was not deemed cost-effective. Samples for such analyses could best be obtained from the principal industrial locus rather than an associated domestic site (Helen Schenck, personal communication 1985).

HISTORICAL RESEARCH

Historical Context - Harford County

Historic settlement in Harford County began in the mid-17th century and, as in other areas of tidewater Maryland, focused on tobacco agriculture (Wesler et al. 1981:91). Settlement was initially concentrated in the coastal areas with expansion into the interior occurring primarily in the 18th century (Wright 1967:28). In 1773, Harford County was created out of Baltimore County (which had initially included the current Harford, Cecil, and Baltimore Counties) (Wright 1967: 59). The original Harford County seat was located at the head of the Bush River at Harford Town, or Bush (Wright 1967: 60). By the time of the creation of Harford County the primary economic adaptation was still agricultural, but wheat production had begun to rival tobacco in importance. Additionally, other economic pursuits had blossomed. These included gristmills, sawmills, lumbering, and iron manufacturing. The early 19th century basically saw a maturation of the economic trends developed in the 18th century while the latter 19th century witnessed a major decline in iron manufacturing with a parallel rise in the canning industry and flint mining and milling industry (Wesler et al. 1981:96). Today, Harford County is primarily agrarian with minor industrial development.

Historical Context - Ironmaking in Maryland

The development of the Harford Furnace complex fits into the general context of industrial development in the United States from the 18th into the 19th century. The first iron manufactory in Maryland dates to the 17th century, though little is known about the activity. Archeological evidence uncovered near St. Mary's City has been suggested to represent the remains of a small scale bloomery using locally available bog iron deposits (Henry Miller, personal communication 1986). In a bloomery, relatively pure iron is superheated and repeatedly beaten into a useable product rather than actually melted and casted as is done in a furnace. The first large scale, successful ironmaking operation in the state was the Principio Furnace located in Cecil County, which was founded in 1720 (Singewald 1911:29). Other major furnaces included the Baltimore Iron Works, Catoctin, and Antietam (Robbins 1973).

A major feature of all these large scale furnaces was the existence of a "company town" to house the workers and provide the amenities of life. The scale of these company towns varied in proportion to the size of the ironmaking operation. At Nassawango, in addition to the furnace and the usual auxiliary buildings, there were workers' houses, a hotel, a store, a church, and a grist mill (Robbins 1973:45). Such a "company town" was a self-sufficient community wherein the company controlled all aspects of the employees' lives, providing credit at the "company store," housing in company-owned dwellings, and often education for the children in a company-owned school.

Before the Civil War, many of the larger ironmaking complexes utilized some form of bound labor. In the 18th century indentured servants were a prevalent form of labor in addition to the use of slave labor (Lewis 1979). Some historians have described the organization of the ironmaking complexes as essentially the same as the traditional plantation system of the southern states (Bining 1970:30). These advocates of the ironmaking plantation thesis argue that the isolated, highly stratified, single product focused systems that utilized bound labor can be characterized as extractive plantation systems. However, this concept has recently been criticized by other researchers. Robbins has pointed out that these furnace communities, particularly in Maryland, were far from isolated. Many of the furnaces were located on major land transportation routes, and with the exception of the western Maryland furnaces, relatively close to navigable water (Robbins 1972:241). However, the closed nature of the iron furnace community can be strongly argued. Consumer choice was generally limited to what was available at the company store. The extreme stratification of such communities added to their isolation from the larger region. In the case of Harford Furnace, it appears that formally bound labor was not used (see Appendix III). The concept of a socially stratified "company town" though, does seem applicable. Upward and outward mobility would exist for individuals willing to improve their economic lot given the lack of legal strictures on such mobility.

In any ironmaking community, the furnace dominated the landscape and was the focus of most activity. A principal need for a charcoal-fired iron furnace was a ready supply of firewood. It has been estimated that 20,000 acres of accessible firewood was needed to supply an iron furnace with a self-replacing source of fuel (Stillgoe 1982:290). Secondly, one needed a nearby supply of iron ore and a source of limestone or shell to act as flux. Stillgoe describes the arrangement of an ironmaking complex thusly:

> Traditional technology dictated the position and form of every furnace. Each stood as near as possible to a proved deposit of iron ore, next to a stream that turned the great wheel that powered the bellows so necessary in producing the blast of air that superheated the charcoal. Each stood on the side of a hill so that the charge of charcoal and ore was easily carted on a ramp to the top of the furnace and dumped onto the half-molten mass at the base. And finally, each furnace stood near a supply of firewood. Everything else, dwellings included, counted very little. Structures were erected wherever there was room and vegetable gardens occupied fertile spots among the slag heaps. What mattered were the ore, the furnace, and the wood [Stillgoe 1982:291].

The technology of an ironmaking establishment such as the one at Harford Furnace is fairly straightforward and little-changed from the Medieval period. Iron ore, charcoal, and some form of flux (generally oyster shell or limestone) were charged in alternating layers into the large stone or brick furnace structure. The furnace was usually shaped like a truncated pyramid with an inverted, funnel-shaped hollow in the center known as the bosh and a constricted area at the base known as the hearth. Forced air was then driven (by means of a water and later steam powered bellows) into the furnace through the tuyere, a metal nozzle for directing the blast into the bosh. This superheated the mass of charcoal, ore, and flux which then separated into molten ore and slag. The heavier iron settled to the bottom of the furnace and was cast out through the tymp, a gate at the bottom of the hearth (Overman 1854; Frye 1984; Heite 1983; Bining 1970).

The Bush Iron Works

Through time, Harford Furnace has been erroneously thought to be the same establishment as the earlier Bush Iron Works. Writing in 1911, Singewald (1911:161), in his seminal study on iron ores and ironmaking in Maryland, states that Harford Furance was known as the "Bush Iron Works" prior to 1861. The first mention of the Bush Iron Works is a 1754 newspaper advertisement offering a reward for the return of a runaway indentured servant (Maryland Gazette 1754). In 1767 the Bush Iron Works was advertised for sale by its owner John Lee Webster (Maryland Gazette 1767). In 1776, the Bush Iron Works was sold to Jacob Giles who in turn deeded the property to another Jacob Giles, presumably his son (Harford County Deed Book JLG:A:235). In that deed, the ironworks are described as located on the Bush River on each side of the "King's Road." As Parrington has pointed out, this contradicts Singewald's identification of Harford Furnace and the Bush Iron Works as being the same facility, as the Harford Furnace is located on James Run (Parrington 1985:10). The Bush Iron Works, based on the deed description, was located near the town of Bush where Maryland Route 7 (which follows the course of the "Kings Road") crosses the Bush River. Therefore, it is clear that the Bush Iron Works and Harford Furnace were not one and the same. Hence, further discussion of the Bush Iron Works is deemed unnecessary so that our research can concentrate on the real Harford Furnace.

Cartographic Research

The Fry and Jefferson (1754) Map of Virginia does not indicate anything in the area of Harford Furnace. Christopher Colles' "Survey of the Roads of the United States" (1789) shows the town of Bush but does not extend far enough north to include what eventually became Harford Furnace. It is interesting to note that Colles' map also does not show the Bush Iron Works but does identify other ironworks (notably Northampton) elsewhere. Dennis Griffith's Map of Maryland (1794) shows the town of Bush but evidences little activity in the area of Harford Furnace. North of the site, Griffith's map indicates a gristmill, but this is well outside of the current research area. Hauducoeur's 1799 map of the head of the Chesapeake Bay and mouth of the Susquehanna River shows the town of Bush but does not extend far enough north to encompass the site of Harford Furnace.

The first map to include Harford Furnace appears to be the Jennings and Herrick map of Harford County (1858). Figure 4 reproduces a detail of the Harford Furnace area. The map appears to indicate one or possibly two structures north of James Run, west of Maryland Route 543, and south of what appears to be an access road to the main furnace complex. This structure or structures are across the road (ancestral Maryland Route 543) from the "Store and P.O." with whom the name "W. Pannell" is associated. The "Store and P.O." is currently a standing structure which has been renovated into a dwelling. It would appear that the structure or structures shown on Figure 4 are within the current research area and are bounded on the north by the above-described access road.

Martenet's 1865 Map of Maryland indicates "Harford Furnace P.O." in the general area of our research but lacks sufficient detail to be of any utility. Martenet's 1878 Map of Harford County shows Harford Furnace in considerable detail (Figure 5). It would appear from this map that some rearrangement of roads had occurred since 1858 (see Jennings and Herrick map above). What later became Maryland Route 543 appears not to have been altered; however, the access road discussed above does not appear on the map, and Goat Hill Road (north of the

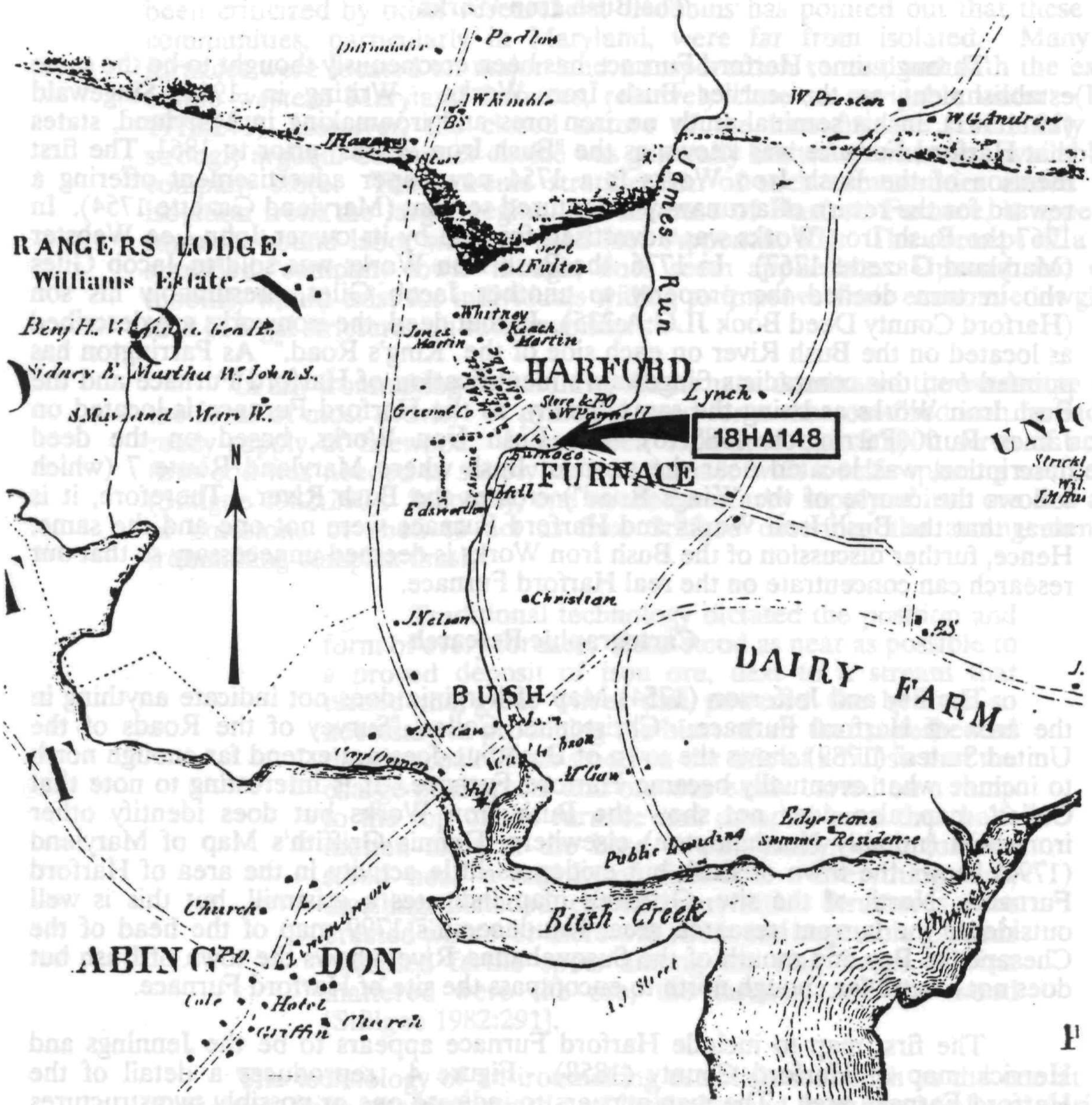


FIGURE 4. Jennings and Herrick Map of Harford County - 1858.

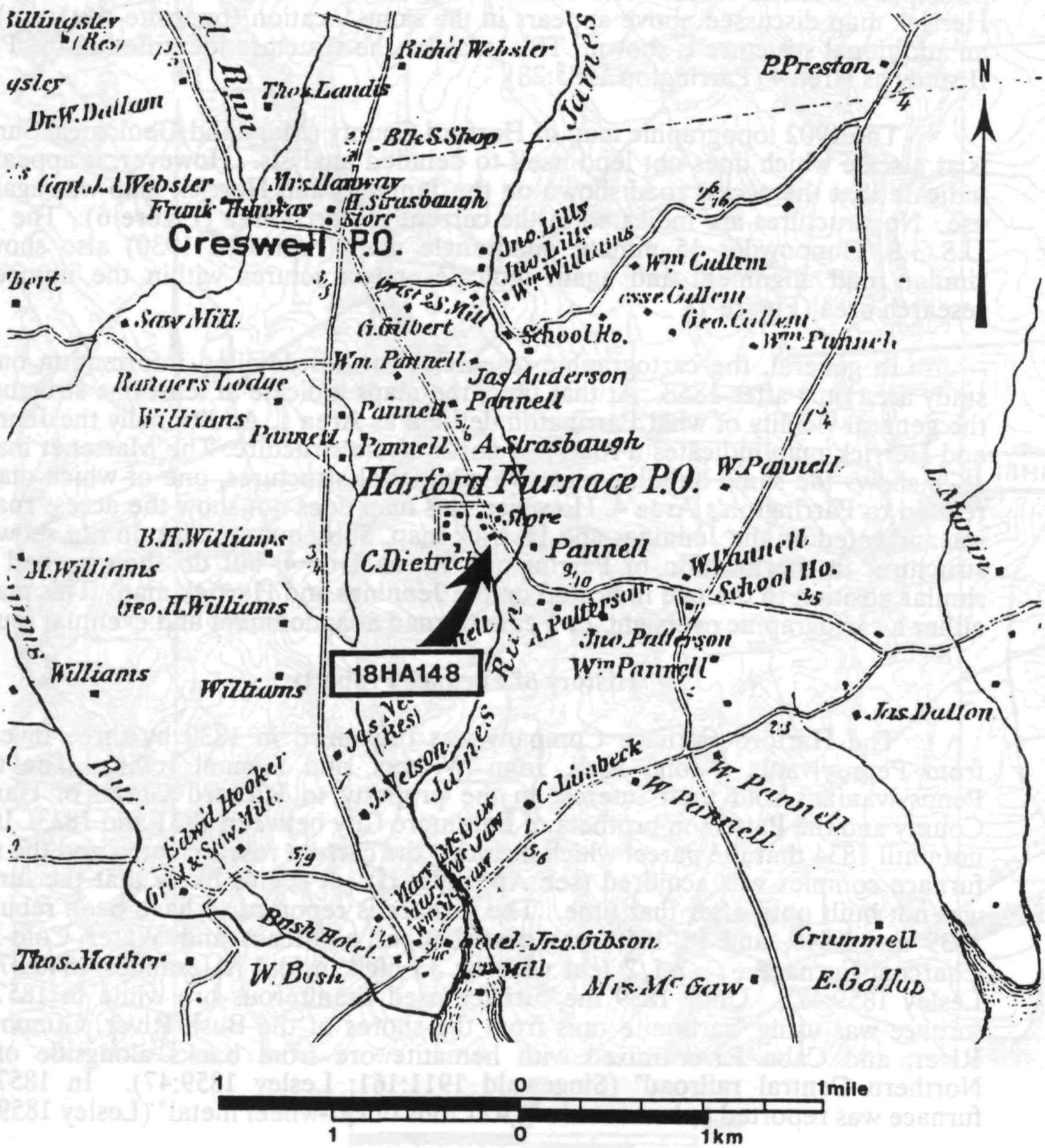


FIGURE 5. Martenet Map of Harford County - 1878.

current research area) appears to have been realigned providing access to the principal industrial locus. The structure which is indicated on the Jennings and Herrick map discussed above appears in the same location (opposite the store) but an additional structure is shown. This may be the structure identified in the Phase II study as Area 4 (Parrington 1985:28).

The 1902 topographic map of Harford County (Maryland Geological Survey) is at a scale which does not lend itself to detailed analysis. However, it appears to indicate that the access road shown on the Jennings and Herrick map was again in use. No structures are indicated in the current research area (Figure 6). The 1901 U.S.G.S. Gunpowder 15 minute quadrangle map (reprinted 1930) also shows a similar road alignment and again indicates no structures within the immediate research area (Figure 7).

In general, the cartographic research provides detailed information on the study area only after 1858. At that time, the maps indicate at least one structure in the general vicinity of what Parrington defined as Area 1. Additionally the Jennings and Herrick map indicates a road just north of the structure. The Martenet map of 1878 shows the same building plus two additional structures, one of which may be related to Parrington's Area 4. However, this map does not show the access road as was indicated on the Jennings and Herrick map. Subsequent maps do not show any structures in the location of Parrington's Areas 1 or 4, but do show a road in a similar position to the one indicated on the Jennings and Herrick map. This may be either a cartographic oversight, or a case of road abandonment and eventual reuse.

History of Furnace Property

The Harford Furnace Company was organized in 1830 by three investors from Pennsylvania - John Kirk, John Withers, and Samuel Irwin. The three Pennsylvanians sold their interest in the property to Richard Green of Harford County and the Patterson brothers of Baltimore City between 1831 and 1833. It was not until 1834 that the parcel which included the current research area and the main furnace complex was acquired (see Appendix II). It seems likely that the furnace was not built until after that time. The furnace is reported to have been rebuilt in 1839 and 1845, and in 1859 was described as a "Steam and Water Cold-Blast Charcoal Furnace . . . 7-1/2 feet wide by 33 high inside" (Alexander 1840:87 and Lesley 1859:47). Until 1839 the furnace used titaniferous ore while in 1857 the furnace was using "carbonite ores from the shores of the Bush River, Gunpowder River, and Caba River mixed with hematite ore from banks alongside of the Northern Central railroad" (Singewald 1911:161; Lesley 1859:47). In 1857 the furnace was reported to have made "1,421 tons of car-wheel metal" (Lesley 1859:47).

The Green Patterson partnership was dissolved in 1846. Green acquired a new partner in the person of Walter Fernandis, a prominent Baltimore attorney. With Green's death in 1862, William Pannel gained control of Green's interest in the property. Pannel sold the title of the property to Joseph Patterson and immediately leased the property from Patterson. Pannel subsequently sold his rights to Clement Dietich in 1867.

Wright (1967:148) states that at its largest, the community comprised 48 buildings. These structures included a store with a post office, a blacksmith shop, a lime kiln, a sawmill, warehouses, workers' houses, and the ironworks complex. The Jennings and Herrick Map of 1858 indicates 18 structures clustered around the

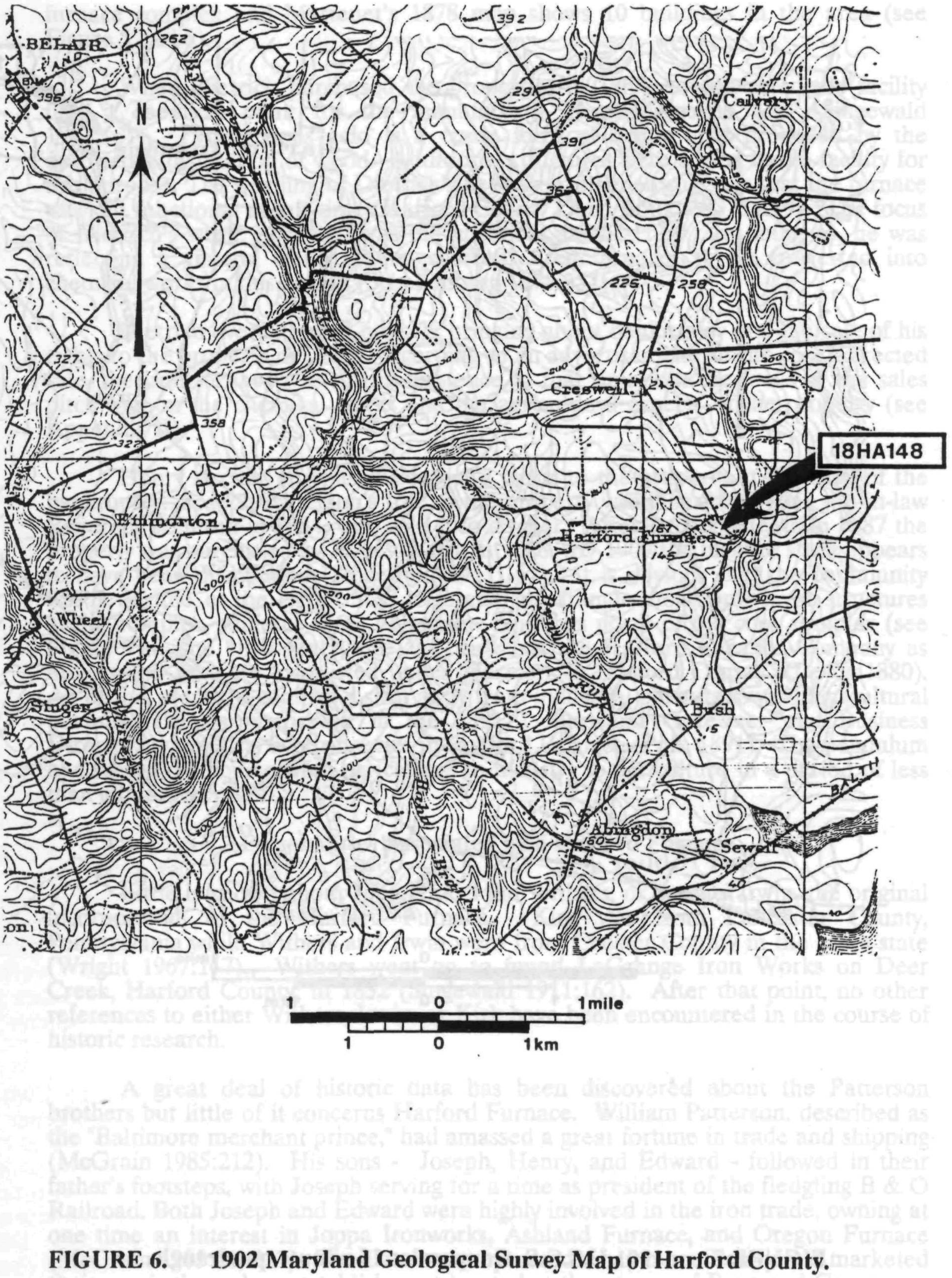


FIGURE 6. 1902 Maryland Geological Survey Map of Harford County.

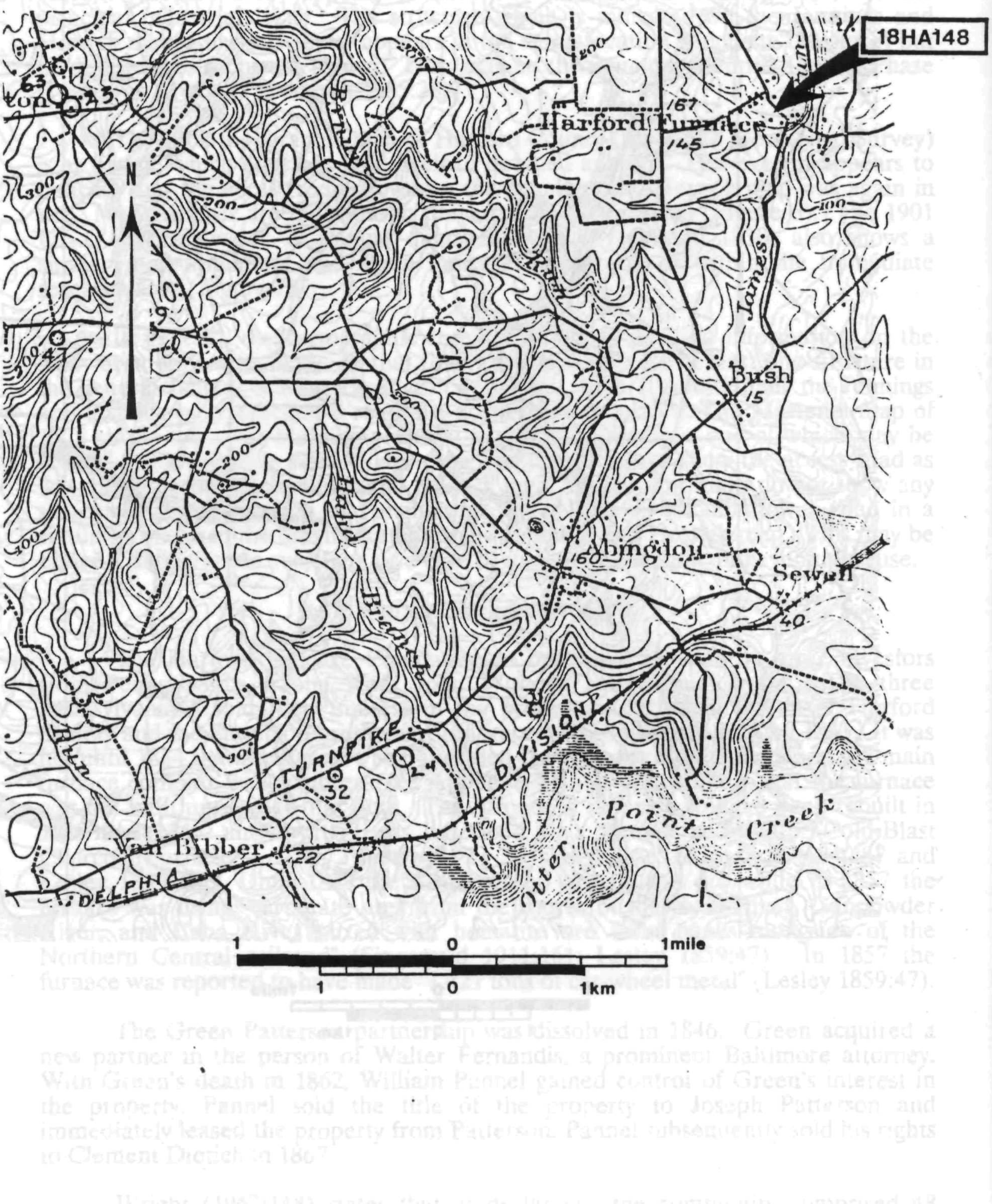


FIGURE 7. 1901 U.S.G.S. Gunpowder 15 minute quadrangle.

furnace complex and Martenet's 1878 map shows 10 buildings in the area (see Figure 5 and 6).

When Dietrich purchased the properties in 1867, he converted the facility into a chemical plant for the manufacture of pyroligneous acid (Singewald 1911:161). Pyroligneous acid is a crude form of acetic acid produced by the destructive distillation of wood. Additional structures were added to the facility for this purpose. The wording of Dietrich's deed from Pannell suggests that the furnace was still functional at this time (Harford County Deed Book WG13:149). The focus of Dietrich's work, however, was the chemical manufactury. In doing so, he was reflecting a general trend among charcoal fired furnaces to be converted into chemical works in this period (Schallenberg 1975:357).

Dietrich overextended himself, bringing about bankruptcy and the sale of his rights to the property in 1878. According to an advertisement for the court-directed sale, the iron furnace was still in existence at that time, but the focus of the sales pitch was on the chemical works and the agricultural aspects of the property (see Appendix II).

Henry Archer purchased Dietrich's rights to the property at the time of the bankruptcy. Joseph Patterson's title to the property was inherited by his son-in-law Reveredy Johnson in 1884, who sold it to Archer. After Archer's death in 1887 the property was purchased by James Walsh in 1888. By 1909 the furnace stack appears to have been dismantled (Singewald 1911:161). It is obvious that the community was in decline, as the 1901 USGS 15 minute quadrangle shows only seven structures at the complex, some of these being new buildings north of the core complex (see Figure 7). The 1880 Maryland Directory lists the Harford Furnace Company as millers and they are also listed under "Farmers in Harford County" (Lewis 1880). All of this seems to confirm a shift away from industrial pursuits toward agricultural pursuits. This is intensified in the 1891/2 Maryland Gazetteer and Business Directory which lists two canneries in Harford Furnace (Polk 1891). The pendulum had swung full course from agriculture to industry to agriculture in a period of less than a hundred years.

Personalities Associated with Harford Furnace

Little is known about John Kirk, John Withers, or Samuel Irwin, the original incorporators of the Harford Furnace. Kirk was from Lancaster County, Pennsylvania while Withers and Irwin were from Chester County in the same state (Wright 1967:147). Withers went on to found LaGrange Iron Works on Deer Creek, Harford County, in 1832 (Singewald 1911:162). After that point, no other references to either Withers, Irwin, or Kirk have been encountered in the course of historic research.

A great deal of historic data has been discovered about the Patterson brothers but little of it concerns Harford Furnace. William Patterson, described as the "Baltimore merchant prince," had amassed a great fortune in trade and shipping (McGrain 1985:212). His sons - Joseph, Henry, and Edward - followed in their father's footsteps, with Joseph serving for a time as president of the fledgling B & O Railroad. Both Joseph and Edward were highly involved in the iron trade, owning at one time an interest in Joppa Ironworks, Ashland Furnace, and Oregon Furnace (McGrain 1985:51, 212). The Pattersons operated a nail manufactory and marketed their goods through an establishment located at the corner of Pratt and Commerce Street in Baltimore City (Matchett 1835). While the Pattersons held a controlling interest in the Harford Furnace, they appeared to have concentrated on the marketing end of the business, leaving the technical aspects to Richard Green.

Richard Green first appears in association with Harford Furnace when he purchased part of John Kirk's interest in the property in 1833. Previously, Green is recorded as manager of Northampton Furnace in Baltimore County in 1820 (McGrain 1985:29). While owning part of Harford Furnace from the mid-1830s, Green, in partnership with Walter Fernandis, also established the ironworks at Oregon Furnace in 1849 (McGrain 1985:50). He and Fernandis had begun purchasing tracts near Oregon, in Baltimore County, as early as 1846 (McGrain 1985:50). In 1852 Oregon was merged with the Ashland Furnace (McGrain 1985:50). Until his death in 1862, Green managed both Oregon and Harford Furnaces. It appears that throughout the period he resided in Harford County (see census research, Appendix III).

Walter Fernandis was a partner to Green in both his Oregon venture and the Harford Furnace Company. Fernandis was a successful attorney who lived and practiced in Baltimore City (McGrain 1985:50). He appears to have focused his involvement in the iron trade in the money and law spheres, leaving the practical ironmaking aspect to Green.

William Pannell was a Harford County native whose involvement in the iron trade began by 1850, when he is listed as a clerk at the store at Harford Furnace in the Federal Census. Sometime between 1855 and 1878 Pannell gained control over the Chesapeake Furnace in Canton (now Baltimore City) (McGrain 1985:56). Pannell maintained ownership of the Chesapeake Furnace until it closed down in 1888 (the last year it is listed in the city directories). At the time of Richard Green's death in 1862, Pannell appears to have been functioning as Green's partner, for, after Green's will was probated, he obtained control of the Furnace property by means of a ground lease from the Pattersons (see Appendix II).

Pannell operated the furnace business until 1867 when he sold his rights to Clement Dietrich. He continued his involvement in the iron trade maintaining his ownership of the Chesapeake Furnace in Canton until his death in the late 1880s. His brother-in-law, Henry Strasbaugh, was the executor of his will and managed to net $55,008.70 for Pannell's heirs (Anonymous 1897:147).

Strasbaugh had earlier worked at Sarah Furnace in Harford County as a clerk for Small and Geiger, then at Ashland for the same firm, and finally at Harford Furnace in 1855 where he managed the company store. He worked at Harford Furnace until 1867 when he transferred to the Chesapeake Furnace which he managed for Pannell. Strasbaugh died sometime after 1897 (Anonymous 1897: 147-148).

Clement Dietrich, who controlled the Harford Furnace property from 1867 to 1876, was born in France and emigrated to America ca. 1830 (Anonymous 1897: 195-196). He initially settled in Cincinnati, Ohio, and established a soap and candle manufactory under the firm of Gross and Dietrich. Sometime during this period he served as president of the Dayton and Michigan Railroad. In 1862 he retired to France, only to return to the United States in 1867 at which time he purchased the rights to the Harford Furnace property (Anonymous 1897: 195-196). Dietrich expended his energy towards converting the furnace property into a large chemical works for the production of pyroligneous acid (a crude form of acetic acid) and wood alcohol (Singewald 1911:161). As previously noted, Dietrich appears to have overextended himself and lost the property in a court case in 1876. It is possible that he had purchased the property when he was already encumbered with debt since among the plaintiffs in the suit were the heirs of Walter Fernandis, who had been Richard Green's partner.

Reveredy Johnson, a prominent Baltimore attorney, inherited the portion of Harford Furnace that includes the area of current research from his father-in-law, Joseph Patterson (see Appendix II). Reveredy Johnson was the son of Reveredy Johnson, who was also a successful Baltimore attorney (McGrain 1985:212). The younger Johnson was president of the Union Manufacturing Company in the 1870s. Although he owned the property at Harford Furnace he appears to have been only peripherally involved in its operation, similar to the earlier Patterson involvement.

None of the individuals described above ever lived at the domicile that was discovered in the course of archeological investigation within the proposed impact area. All have been documented as living elsewhere in Maryland.

The Iron Workers: Community Composition

Since the site occupants never owned the property, it is not feasible to associate an individual or individuals with the property as residents. An attempt was made to associate individuals through use of the Harford County tax assessment records, but an exhaustive search indicates that these records are no longer extant. Attempts to associate individuals listed in the census with the structure have failed to provide any names of the specific site occupants. Historical maps consulted list the landowner rather than the site occupant. Under these constraints it was deemed prudent to attempt to reconstruct the community makeup as a whole. To this end, extensive historic research was undertaken with the federal census records.

The Harford Furnace community was made up of a varying number of individuals engaged in a variety of occupations throughout the period of site florescence. Based on the premise that the domestic locus under consideration was the residence of ironworkers and their families, this analysis will focus on individuals involved directly in the manufacture of iron. This appears to be a reasonable hypothesis given the site's proximity to the industrial center, the size and nature of the domicile located there, and the community's long-term focus on iron manufacturing.

The following analysis is based on information gleaned from the Federal Censuses for the years 1850, 1860, and 1870 (see Appendix III). These censuses were chosen because of the comparability of the data collected and the opinion of the researchers that they are representative of the furnace community.

In general, the census data suggest a lack of continuity through time. Only one worker appears as an ironworker in all three censuses and only two others appear in two censuses. Many of the individuals appear in several censuses, but they are no longer listed as ironworkers. Many are listed first as ironworkers and later as farmers or other professions. This suggests that, as these men acquired wealth, they shifted from ironworking to agrarian occupations. Although these men often started their families while still working at the furnace, when they had sufficient capital to acquire property, they got out. This would be in keeping with the Jeffersonian ideal of yeoman farmers which permeated the American culture throughout the 19th century (Stillgoe 1982).

The ironworkers in residence at Harford Furnace in 1850 were predominantly foreign-born, primarily in their mid-thirties, of whom nearly half were married with children. Of a sample of 27 workers, nine were German, 11 were Irish, and the remaining were U.S. born (this includes one Black). Forty-eight percent of the ironworkers were married with from 0-6 children (Table 1). The average number of children was 3.5. The age distribution of the workers shows a clustering of men in their thirties and early forties with a lesser grouping of young men around age 20 (Figure 8).

The work force in 1860 was slightly older, less foreign-born, more likely to be married and likely to have slightly fewer children than in the preceding decade. The 1860 sample of ironworkers suggests a decrease in the number of foreign-born workers - one German, six Irish, one unknown, and 10 U.S.-born. Eighty-eight percent of the workers were married with from 0-8 children (Table 1). The average number of children was slightly more than 3. The age distribution suggests a somewhat older work force than the preceding census with an age peak of 35 to 45 (Figure 8).

The 1870 sample suggests a work force which in make-up was intermediary to the 1850 and 1860 groups. The census data suggests an increase in the number of foreign-born workers with the foreign-born making up 63% of the entire work force. Approximately the same percentage were married, with from 0-6 children (Table 1). The age distribution is rather similar to the age distribution recorded in the 1850 census (Figure 8). The major cluster was for men aged around 30 to 35 years old with a lesser cluster for those 20 years old and younger.

In an attempt to further investigate the community of ironworkers living at Harford Furnace, a transcription of individuals requesting naturalization in Harford County for the years 1830 to 1839 and 1857 to 1864 was compared with the ironworkers recorded in the censuses (Parks 1980). Only two individuals appeared in both records. Patrick Clark, from County Caven, Ireland, appeared before the court with James Christie (then manager of the Harford Furnace) and Michael Farley as witnesses on May 17, 1858 for naturalization (p. 19). On the same day, David Russell, also of Ireland, appeared with the same witnesses for the naturalization procedure (p. 25). While these are the only two individuals who were listed in both the transcription and in our sample of ironworkers, it seems likely that other immigrants sought U.S. citizenship after the mandatory five years residence.

Through time, the Harford Furnace workers were likely to be foreign-born, likely to be married with offspring, and tended to cluster in age in their thirties. The 1870s data suggest a somewhat younger work force. This may be a function of the large number of young males slain in the Civil War, which would have necessitated hiring younger individuals in the following decade. It appears at least some took the necessary steps to become U.S. citizens. In general, ironworkers seem to be a younger group of immigrants who did not stay in the trade for a long time, opting instead to acquire land and take up farming.

TABLE 1. **Family composition at Harford Furnace through time.**

1850			
TOTAL MARRIED	13	TOTAL CHILDREN	45
TOTAL WORKERS	27	SMALLEST # OF CHILDREN	0
% MARRIED	48.15%	LARGEST # OF CHILDREN	6
AVERAGE # OF CHILDREN	3.46		
1860			
TOTAL MARRIED	16	TOTAL CHILDREN	49
TOTAL WORKERS	18	SMALLEST # OF CHILDREN	0
% MARRIED	88.89%	LARGEST # OF CHILDREN	8
AVERAGE # OF CHILDREN	3.06		
1870			
TOTAL MARRIED	12	TOTAL CHILDREN	33
TOTAL WORKERS	19	SMALLEST # OF CHILDREN	0
% MARRIED	63.16%	LARGEST # OF CHILDREN	6
AVERAGE # OF CHILDREN	2.75		

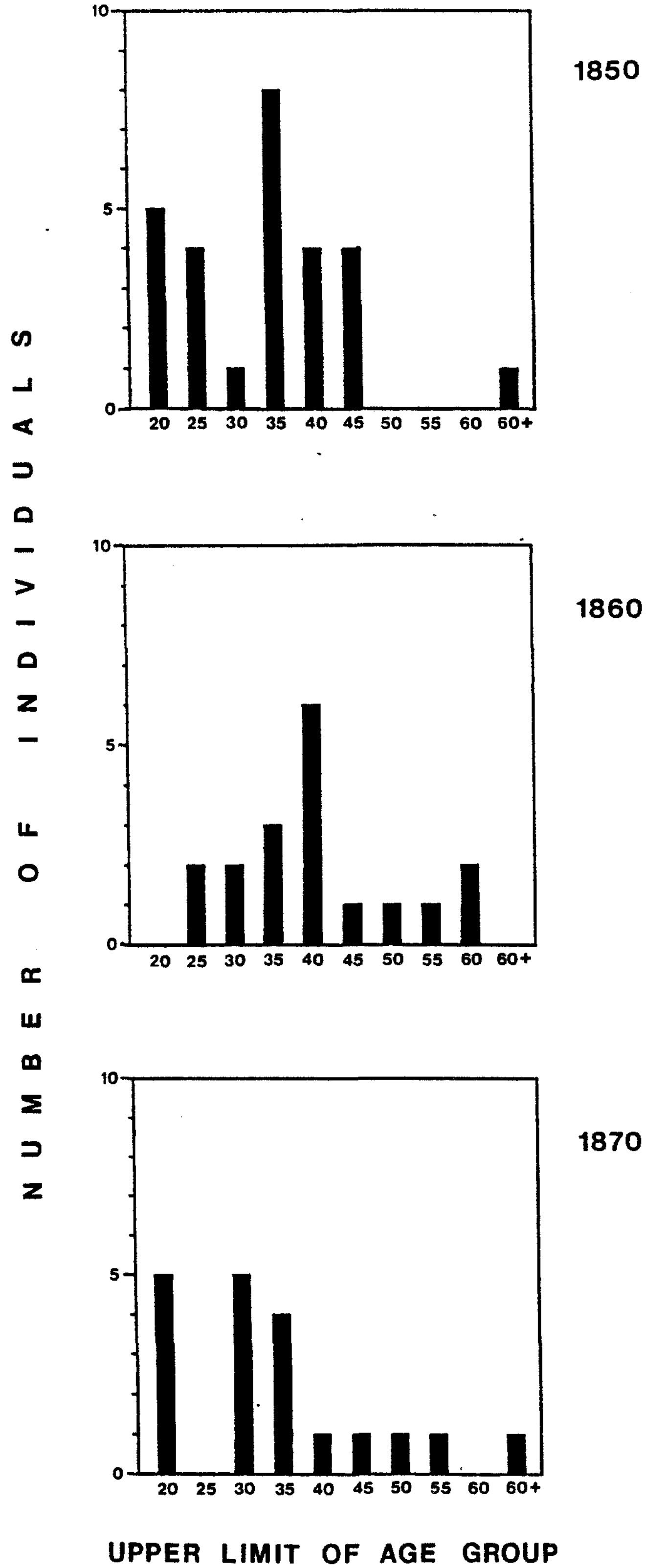


FIGURE 8. Age distribution of Harford Furnace iron workers.

THE EXCAVATIONS

Field Methods

The field methods utilized in this project were created to maximize recovery of data in a timely and efficient manner. Based on the previous researchers' data, a sample universe roughly 20 m by 60 m (66 ft x 197 ft) was defined. Within this universe, a 7% stratified non-aligned random sample of 2 m x 2 m (7 ft x 7 ft) squares was chosen. The sample was designed in such a way as to avoid the previous researchers' test units and the numerous large trees present on the site. In all, 20 squares were proposed to be excavated. These units were dug only to the top of subsoil. Although the site had been interpreted as unplowed, as excavation proceeded it became apparent that large portions of the site had been plowed after abandonment. Therefore, the stratified sample represents material solely in the plowzone. The soil was excavated in 1 m x 1 m units within the 2 m x 2 m squares in natural horizons whenever feasible, with strata (including the plowzone) thicker than 10 cm (4 in) broken into 10 cm arbitrary levels. All cultural material, with few exceptions, was retained. The exception was the omni-present slag. Slag was quantified for the northwest meter square of each unit and a 2-liter (2 quart) sample of slag was retained from each layer or level of the northwest meter square. All soils excavated were water-screened through 1/4-inch mesh and a 2-liter flotation sample was retained from each layer and/or level of the northwest meter square. All cultural features and soil anomalies apparent at the top of subsoil were plotted on measured drawings and photographs were taken when appropriate. Additionally, all units which demonstrated any stratigraphic anomalies (i.e., other than simple plow zone) had profiles drawn to scale.

Following completion of the sampling strategy, large areal excavations were undertaken. Using a Gradall, the plow disturbed soils were removed from an area of approximately 40 m x 16 m (131 ft x 52 ft). The spoil was removed from the research area by dump truck. No attempt was made to systematically recover artifacts from this spoil, but artifacts were grab-sampled when observed. Following the mechanical stripping, a combination of shovel, hoe, and trowel work was used to expose cultural features. All features were plotted in plan on 1:10 scale drawings, and photographs were taken when appropriate. Features were generally excavated in cross-section with scaled profiles drawn. Photographs of feature profiles were taken when appropriate. Flotation and slag samples were retained from all features. All soil excavated from the features was water-screened through 1/4-inch mesh with all cultural material retained. Architectural features were photographed, mapped, and sampled.

In addition to the primary research area outlined above, two additional archeological tasks were undertaken. These involved photographic documentation of the retaining wall identified by the previous researchers and mapping of the headrace. Additionally, a profile cut through the headrace was completed and a scaled drawing of the cross-section executed.

Unit Excavations

Sampling Strategy

In order to typify the domestic debris in Area 1 (Figures 3 and 9), a strategy of stratified random sampling was undertaken prior to areal stripping of the overburden. The universe for this sampling was bounded by the existing right-of-

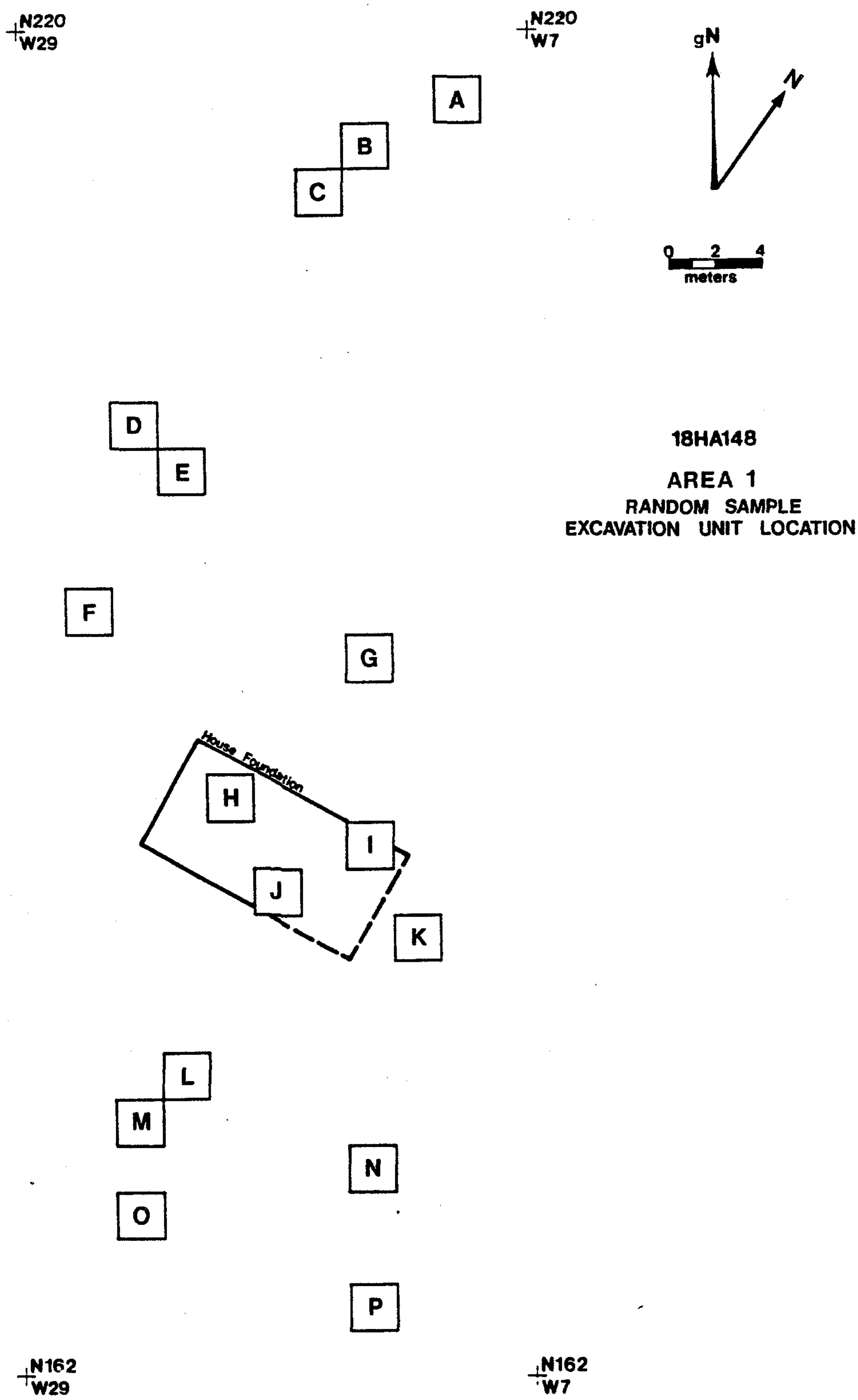


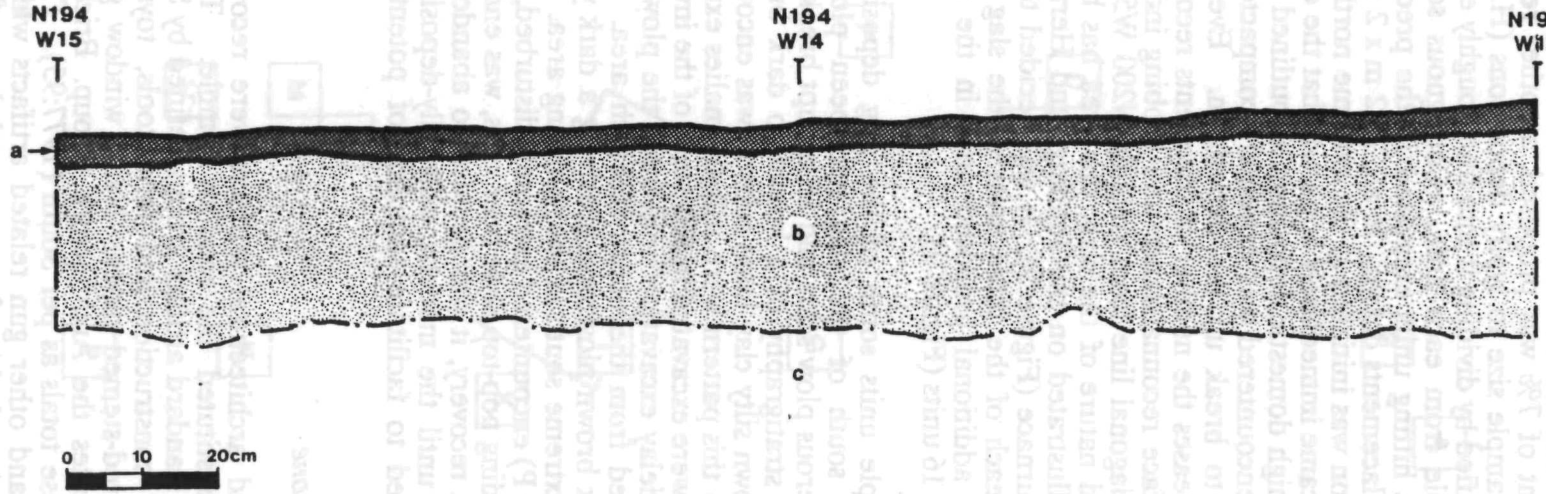
FIGURE 9. Location of random test units.

way line on the west, the proposed impact limit on the east, grid line N164 on the south and grid line N220 on the north. This constituted an area of roughly 1100 m^2 (11,800 ft^2). A sample quotient of 7% was proposed, as other researchers have found this to be an adequate sample size to typify depositions (H. Miller 1983:9, 1986:6). The universe was stratified by dividing it into four roughly equal areas, and randomly drawing a 7% sample from each area. Contiguous squares, squares occupied by trees, and squares hitting units excavated in the preceding Phase II testing were eliminated and replacements drawn. In all, 20 2 m x 2 m squares were chosen for excavation. Excavation was initiated at the extreme north of the sample area in three of the units. It became immediately apparent that the excavation units were not located in an area of high domestic deposition as outlined by the previous researcher. Instead, what we encountered was extremely compacted slag. It was necessary to utilize pick-axes to break up the deposition. Even utilizing this technique, which markedly increases the number of fragments recovered, very few artifacts were discovered. Surface reconnaissance and probing indicated that the slag layer was bounded by a diagonal line from roughly N200 W5 to N214 W27. Given the extremely compacted nature of the slag, this area has been tentatively identified as the access road illustrated on the Jennings and Herrick (1858) and subsequent maps of Harford Furnace (Figure 9). It was decided to complete one quadrant to sterile subsoil in each of the three units in the slag deposit and to remove from our sample the additional proposed units in the slag area. This decreased the overall sample to 16 units (Figure 9).

Excavation of the sample units south of the slag deposition proceeded smoothly. The area to the south of the slag had been plowed after site abandonment resulting in numerous plow scars and an abrupt break between plowzone and subsoil. A uniform stratigraphy of a brown to dark brown silty loam overlaying a dark yellowish brown silty clay loam subsoil was encountered (Figure 10). The general exceptions to this pattern were soil anomalies extending into the subsoil. None of these features were excavated in this stage of the investigations as it was thought more prudent to delay excavation until after the plow disturbed soils had been mechanically removed from the entire research area. The consistent stratigraphy of a brown to dark brown plowzone overlying a dark yellowish brown subsoil abruptly ended in the extreme south of the sampling area. The final three pits excavated (Units N, O, and P) encountered extremely disturbed, water-lain sand deposits. Modern debris, including pop-top style beer cans, was encountered in the excavations. To maximize data recovery, it was decided to abandon excavation of the three southernmost units until the modern, alluvially-deposited overburden could be mechanically removed to facilitate sampling of potentially significant buried resources.

Distribution of Artifacts in Plowzone

Numerous domestic and architectural artifacts were recovered from the plow-disturbed soils which constituted the random sample. Tables 2 and 3 summarize the material by the standard artifact groups defined by South (1977:96). The Activity Group includes construction and farm tools, toys, fishing tools, miscellaneous hardware, and red-stemed pipes. Nails, window glass, and other architectural hardware constitutes the Architecture Group. Bricks, mortar, and plaster are not included in these totals as per South (1977:95). The Arms Group includes lead shot, gunflints, and other gun related artifacts while the Clothing Group is made up of buttons, other clothing fasteners, and shoe remains. Furniture hardware constitutes the Furniture Group. The Kitchen Group includes ceramic and glass vessel fragments, and cooking and food preparation implements but does



a = very dark brown (10YR2/2) silt loam (humus)
b = very dark gray (10YR3/1) silt loam containing slag, brick fragments and charcoal flecks (plowzone)
c = dark grayish brown (10YR4/2) sandy loam mottled with 20% brown (7.5YR4/4) silt loam and 10% very dark gray (10YR3/1) silt loam (subsoil)

FIGURE 10. Typical profile of plow disturbed soils - Test Unit G.

TABLE 2. Artifacts by use group in relation to house (numbers).

UNIT	ACTIVITY GROUP	ARCHITECTURE GROUP	ARMS GROUP	CLOTHING GROUP	FURNITURE GROUP	KITCHEN GROUP	PERSONAL GROUP	TOBACCO PIPE GROUP	TOTAL	INTERPRETATION
A	9	62	0	3	0	297	0	3	374	SLAG
B	0	1	0	0	0	20	0	0	21	ROAD
C	0	1	0	1	0	34	0	1	37	
D	6	234	0	4	2	840	0	15	1101	BACK
E	11	447	0	8	2	1205	4	30	1707	YARD
F	26	759	1	12	0	1671	5	39	2513	
G	13	512	1	6	4	1368	4	51	1959	
H	41	1158	2	56	2	1107	15	52	2433	HOUSE
I	7	628	1	14	0	541	10	25	1226	
J	49	821	4	47	0	923	18	63	1925	
K	11	423	0	8	2	247	1	12	704	FRONT
L	10	742	1	12	0	1245	4	48	2062	YARD
M	15	539	0	4	0	1159	1	38	1756	
N	4	388	0	3	0	532	1	19	947	SCOURED
O	9	205	0	8	0	589	1	20	832	AREA
P	4	206	0	1	0	160	0	10	381	

TABLE 3. Artifacts by use group in relation to house (percentages).

UNIT	ACTIVITY GROUP	ARCHITECTURE GROUP	ARMS GROUP	CLOTHING GROUP	FURNITURE GROUP	KITCHEN GROUP	PERSONAL GROUP	TOBACCO PIPE GROUP	TOTAL	INTERPRETATION
A	2.406%	16.578%	0.000%	0.802%	0.000%	79.412%	0.000%	0.802%	100%	SLAG
B	0.000%	4.762%	0.000%	0.000%	0.000%	95.238%	0.000%	0.000%	100%	ROAD
C	0.000%	2.703%	0.000%	2.700%	0.000%	91.892%	0.000%	2.703%	100%	
D	0.545%	21.253%	0.000%	0.360%	0.182%	76.294%	0.000%	1.362%	100%	BACK
E	0.644%	26.186%	0.000%	0.470%	0.117%	70.592%	0.234%	1.757%	100%	YARD.
F	1.035%	30.203%	0.040%	0.480%	0.000%	66.494%	0.199%	1.552%	100%	
G	0.664%	26.136%	0.051%	0.310%	0.204%	69.832%	0.204%	2.603%	100%	
H	1.685%	47.596%	0.082%	2.300%	0.082%	45.499%	0.617%	2.137%	100%	HOUSE
I	0.571%	51.223%	0.082%	1.140%	0.000%	44.127%	0.816%	2.039%	100%	
J	2.545%	42.649%	0.208%	2.440%	0.000%	47.948%	0.935%	3.273%	100%	
K	1.560%	60.085%	0.000%	1.140%	0.284%	35.085%	0.142%	1.705%	100%	FRONT
L	0.485%	35.984%	0.048%	0.580%	0.000%	60.378%	0.194%	2.328%	100%	YARD
M	0.850%	30.695%	0.000%	0.230%	0.000%	66.002%	0.057%	2.164%	100%	
N	0.422%	40.971%	0.000%	0.320%	0.000%	56.177%	0.106%	2.006%	100%	SCOURED
O	1.082%	24.639%	0.000%	0.960%	0.000%	70.793%	0.120%	2.404%	100%	AREA
P	1.050%	54.068%	0.000%	0.260%	0.000%	41.995%	0.000%	2.625%	100%	

not include any faunal or floral remains (again, per South 1977). Coins, keys, and other personal items constitute South's Personal Group (1977:95). Ball clay pipestem and pipe bowl fragments are included in the Tobacco Pipe Group.

Artifact distributions from plowzone (Figures 11 through 23) show a consistent concentration within and around the structure with an additional, smaller concentration in the northern yard. The distribution of total artifacts concentrates around a structure (see below) and in the back yard (Figure 11). Architectural material concentrates in and around the location of the structure while Kitchen Group artifacts tend to cluster within the structure and to the northwest of the structure (Figures 12 and 13). Clothing Group artifacts (primarily buttons) are quite concentrated within the structure as are artifacts of the Personal Group (Figures 14 and 15). Tobacco pipe fragments, Activity Group artifacts, arms, and Furniture Group artifacts all demonstrate a very similar distribution to all the previously mentioned classes: concentration in and around the structure (Figures 16, 17, 18, and 19).

In an attempt to further delineate activity and deposition in Area 1, various elements of the Kitchen Group and the Architecture Group were mapped separately. Figure 20 illustrates the distribution of bottle glass. The pattern is essentially the same as the kitchen group as a whole, but does demonstrate somewhat more dispersal of material. The distribution of refined dining wares (Figure 21) closely mimics the general kitchen pattern as does the distribution of utilitarian ceramics (Figure 22). Figure 23 illustrates the pattern of cut nails. Again, this distribution is very similar to the overall pattern of architectural material. This is not surprising since nails make up the bulk of the architectural items. In general, the discrete portions of the various functional groups appear to mimic the overall group to which they belong.

The general pattern of artifact distribution in the plow disturbed soils at the Harford Furnace site is one of concentration in the structure with densities decreasing away from the structure. This is not surprising since the structure would be the center of activity, and hence, deposition on the site. The material in the plowzone probably represents demolition debris, yard midden, and the tops of features which were homogenized through the course of plowing. A slightly greater amount of debris appears to occur in the north yard area than in the south yard area, suggesting that the southern facade of the house may have been the formal side while the northern yard was a service and activity area. It appears that the greatest amount and variety of deposition occurred in the structure (Units H, I, and J), with the concentration decreasing away from the structure. The north yard appears to have a high concentration of both quantity and variety of debris than the south yard. North of the "back" yard is a relatively artifact-free zone interpreted as a slag-metaled access road (see Figure 24).

Feature Discussion

The principal architectural feature uncovered in the course of both sampling and large areal excavation was a mortared, roughly dressed fieldstone foundation (Figure 25). The eastern portion of the foundation had been greatly disturbed by plowing in the past so dimensional data on the overall building was not obtainable. The structure had an "H" shaped central chimney with two hearths. The eastern cell measured 5.2 m by 5.4 m (approximately 16 ft by 16 ft), and, if one assumes a symmetrical arrangement, this would suggest an overall building size of 5.2 m by 10.8 m (approximately 16 ft by 32 ft). Based on the width of the foundation and the

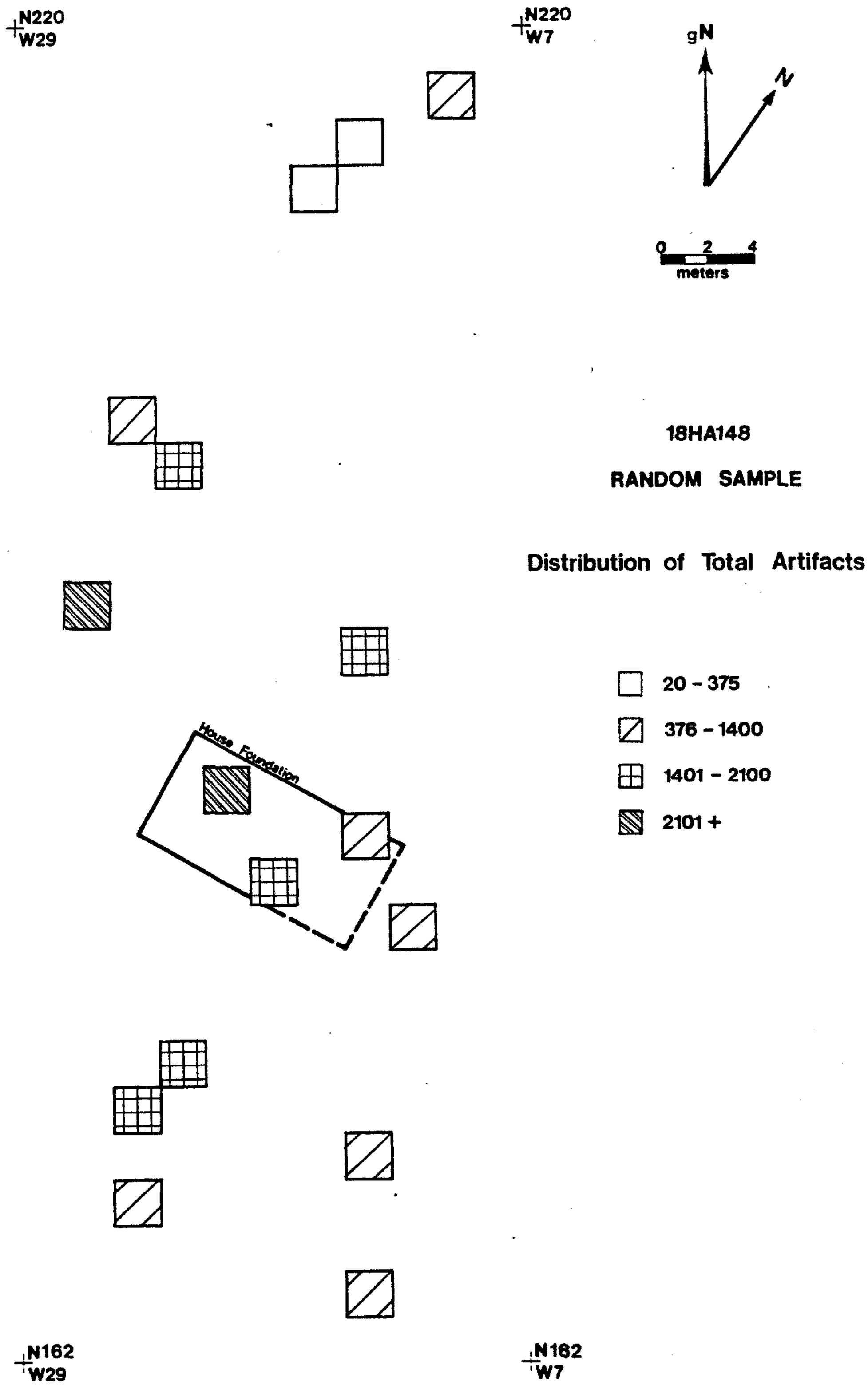


FIGURE 11. Distribution from random tests - Total artifacts.

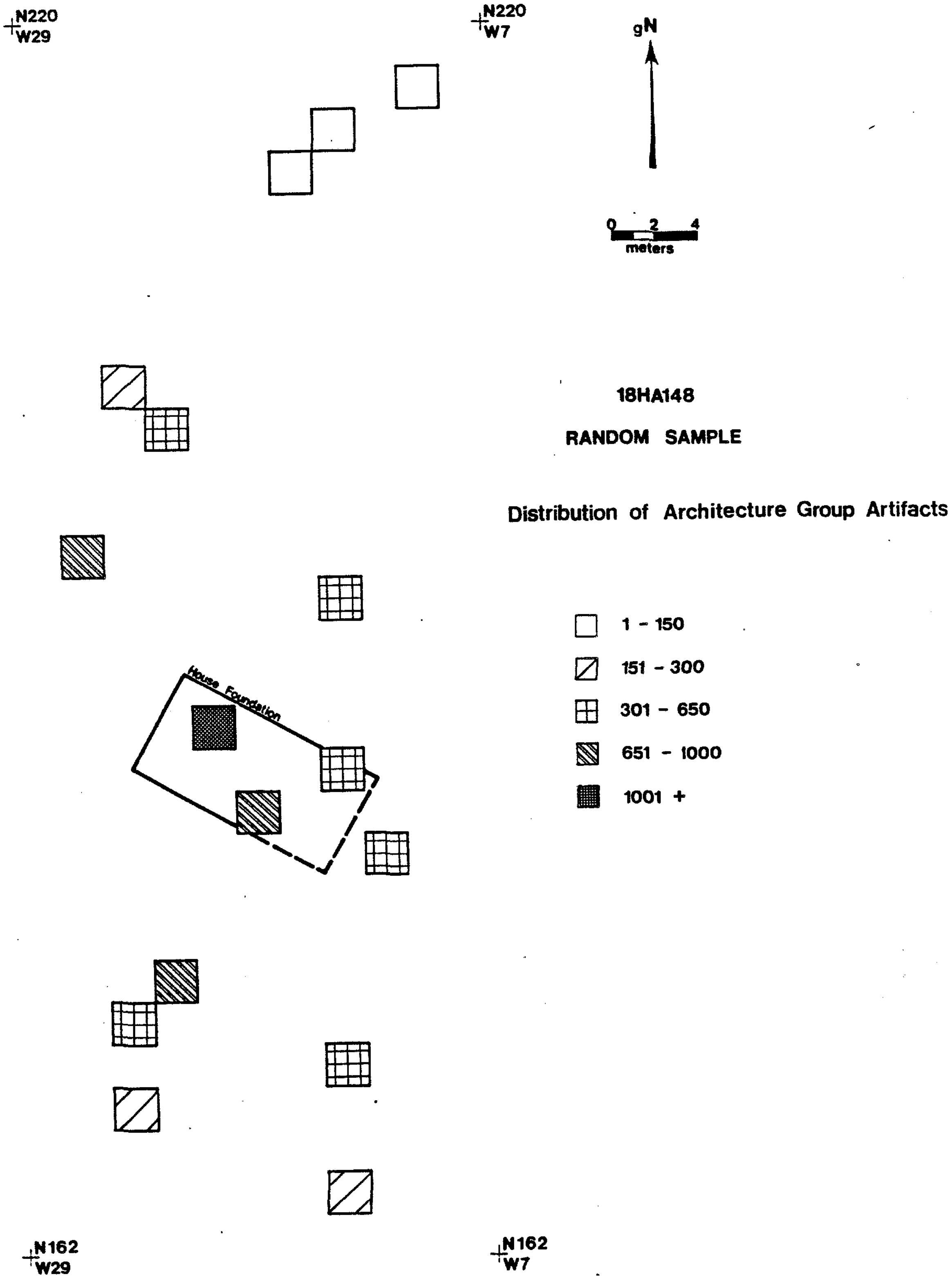


FIGURE 12. Distribution from random tests - Architectural artifacts.

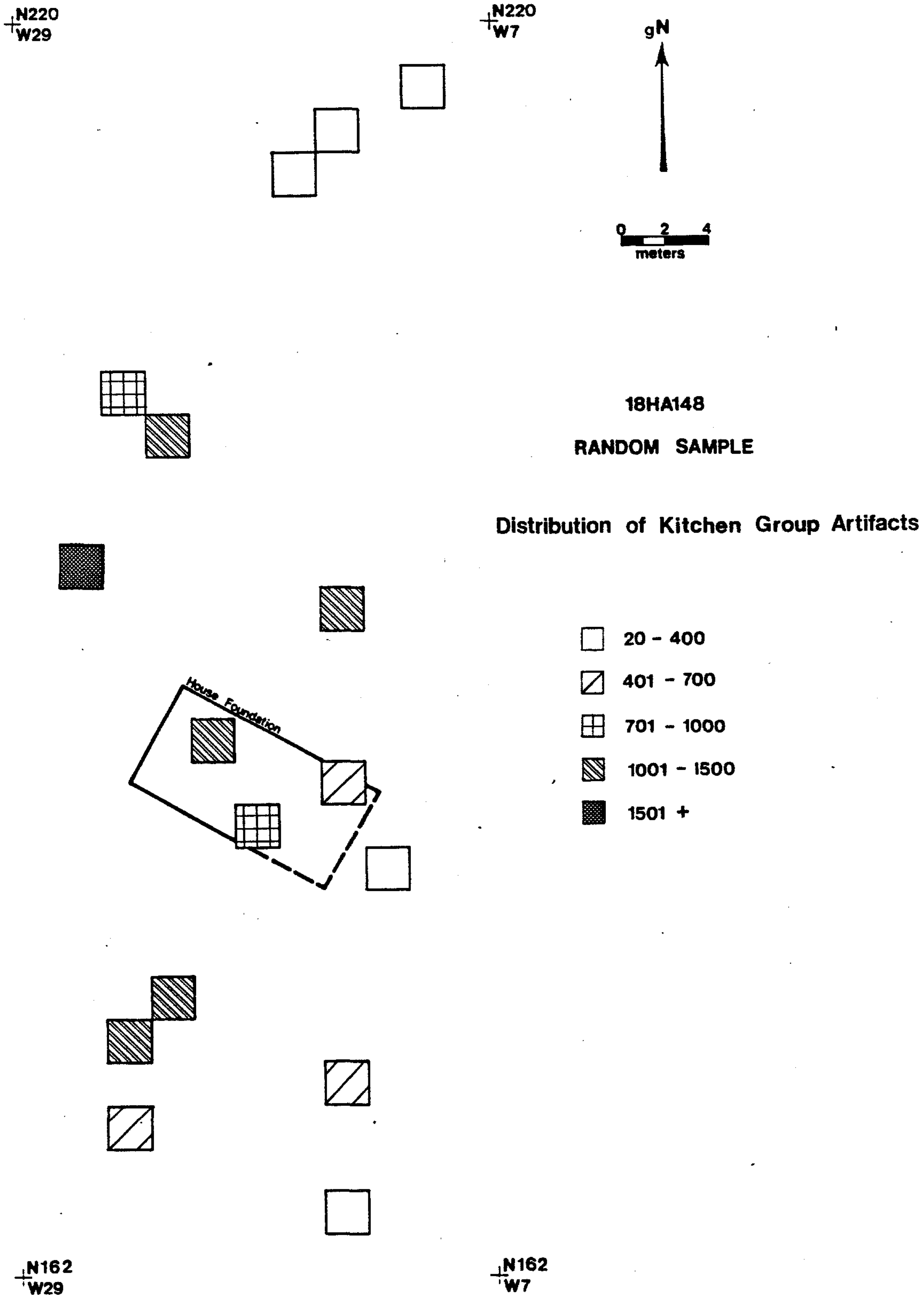


FIGURE 13. Distribution from random tests - Kitchen artifacts.

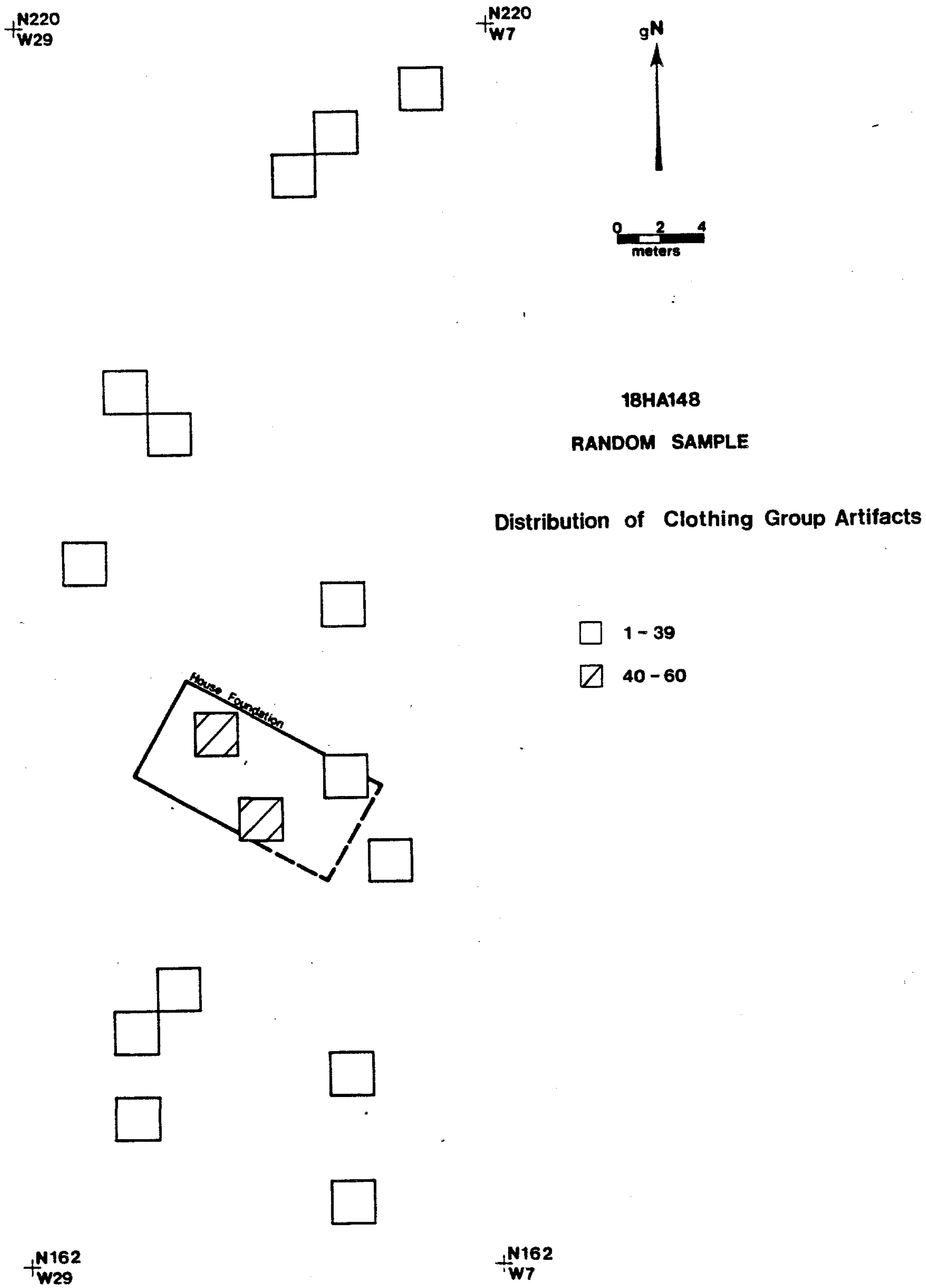


FIGURE 14. Distribution from random tests - Clothing artifacts.

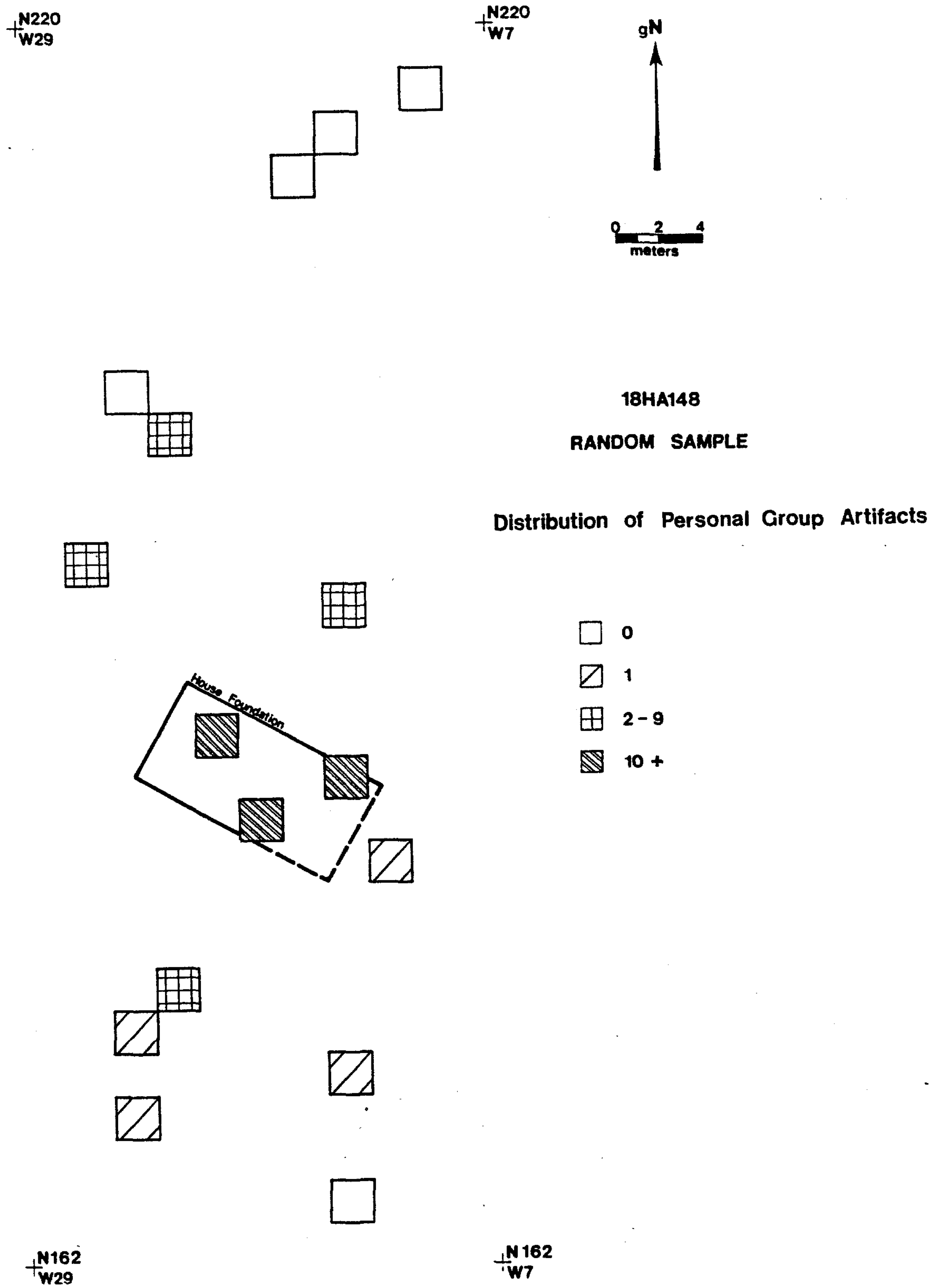


FIGURE 15. Distribution from random tests - Personal artifacts.

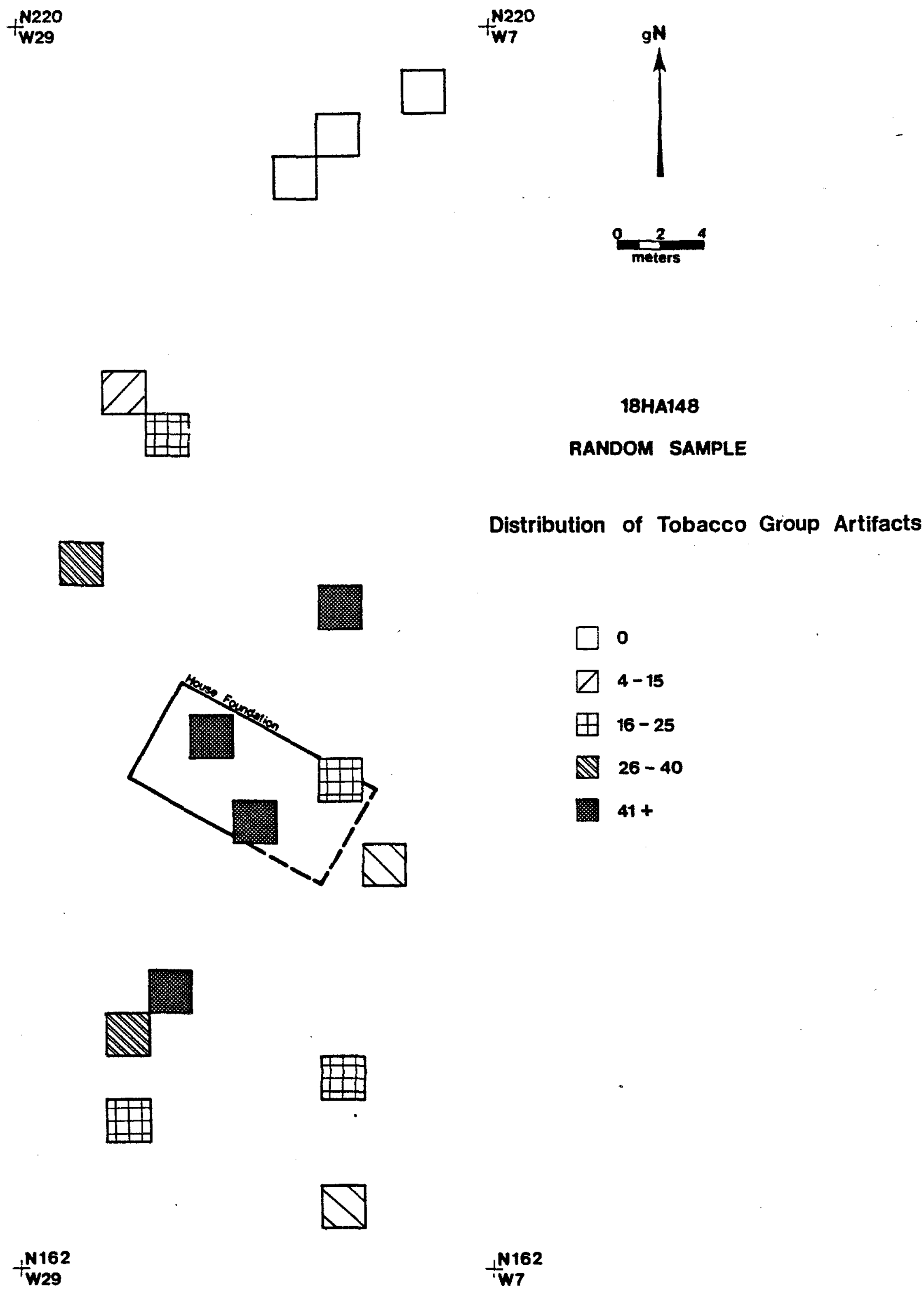


FIGURE 16. Distribution from random tests - Tobacco pipes.

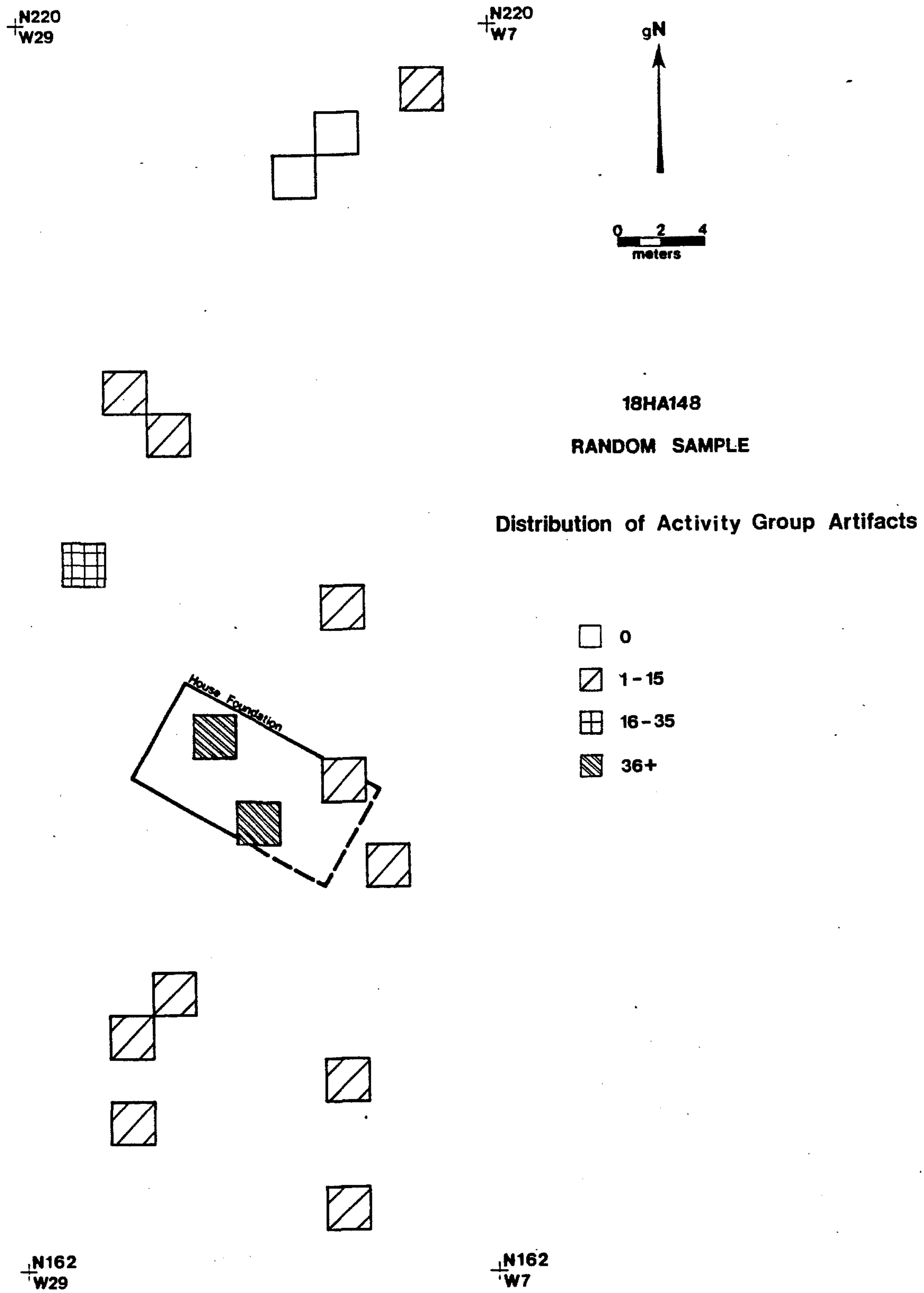


FIGURE 17. Distribution from random tests - Activity artifacts.

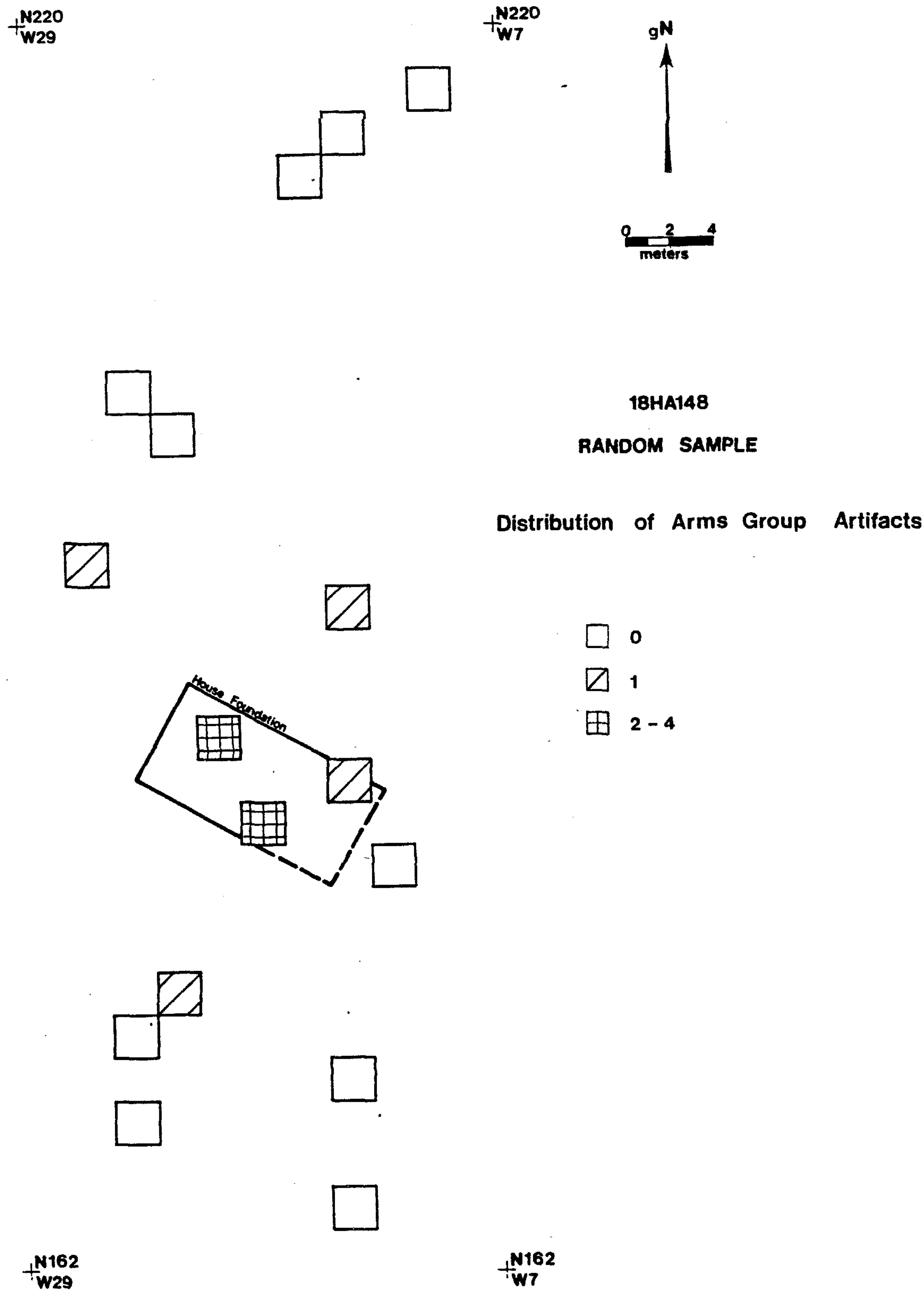


FIGURE 18. Distribution from random tests - Arms artifacts.

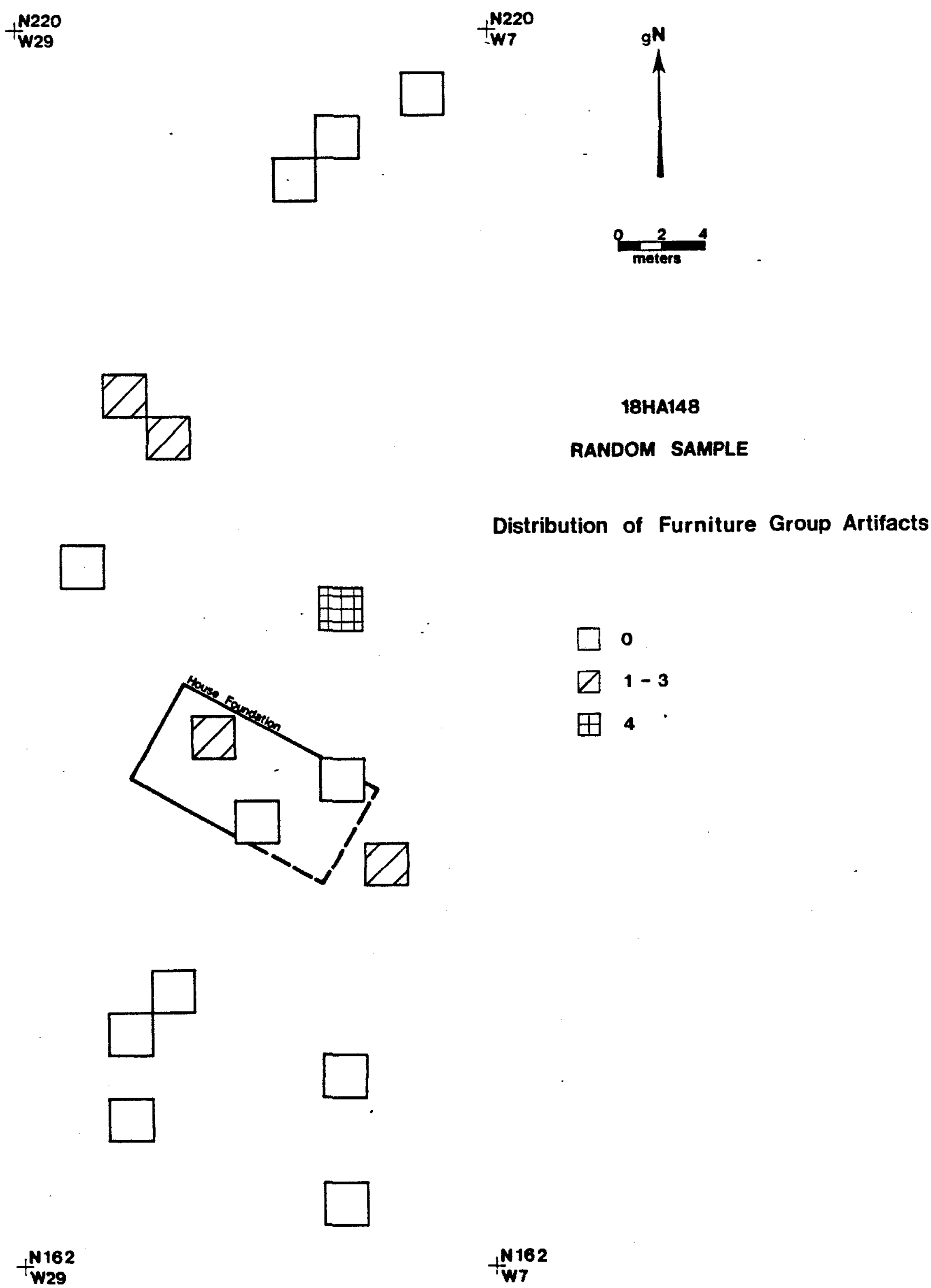


FIGURE 19. Distribution from random tests - Furniture artifacts.

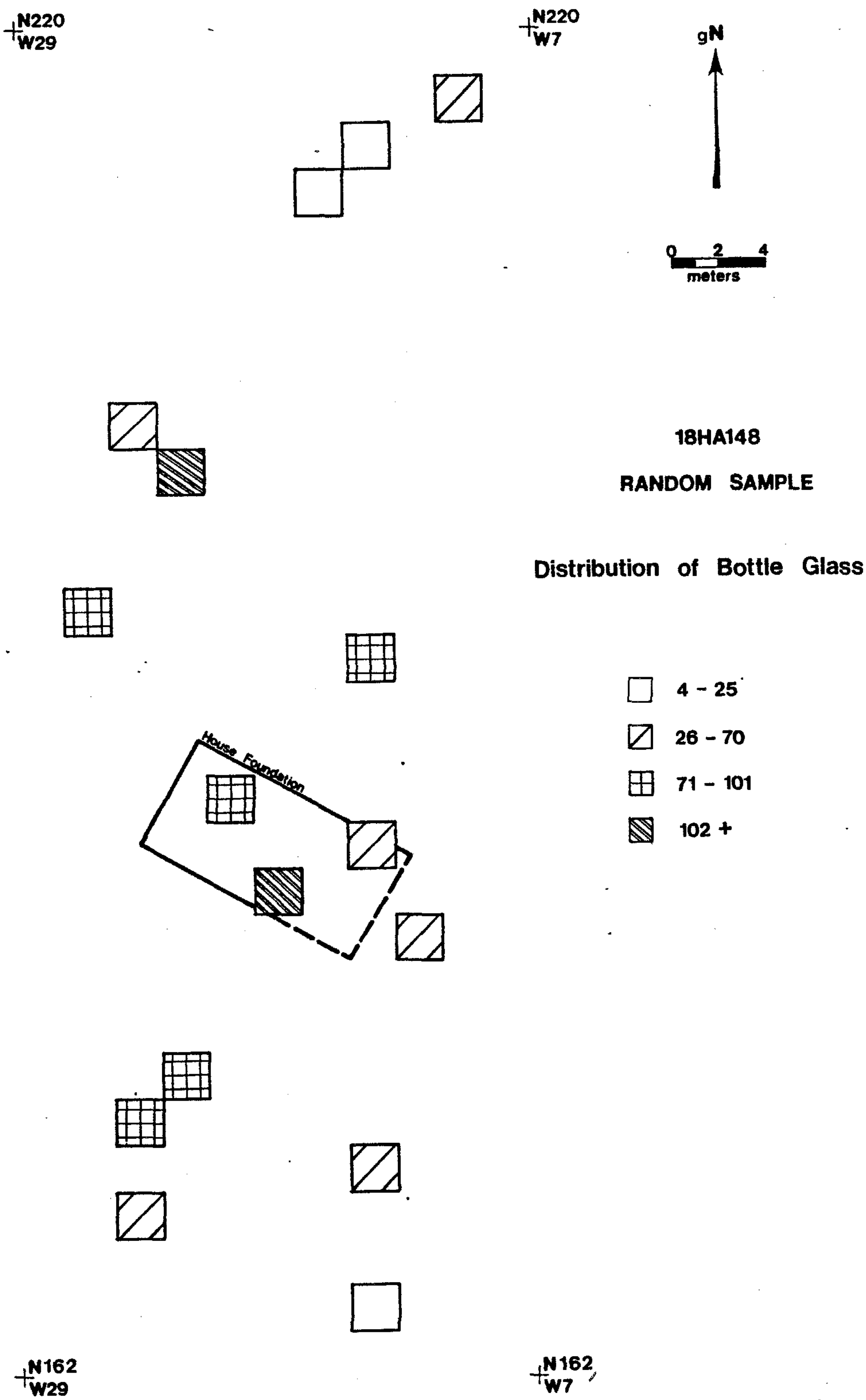


FIGURE 20. Distribution from random tests - Bottle glass.

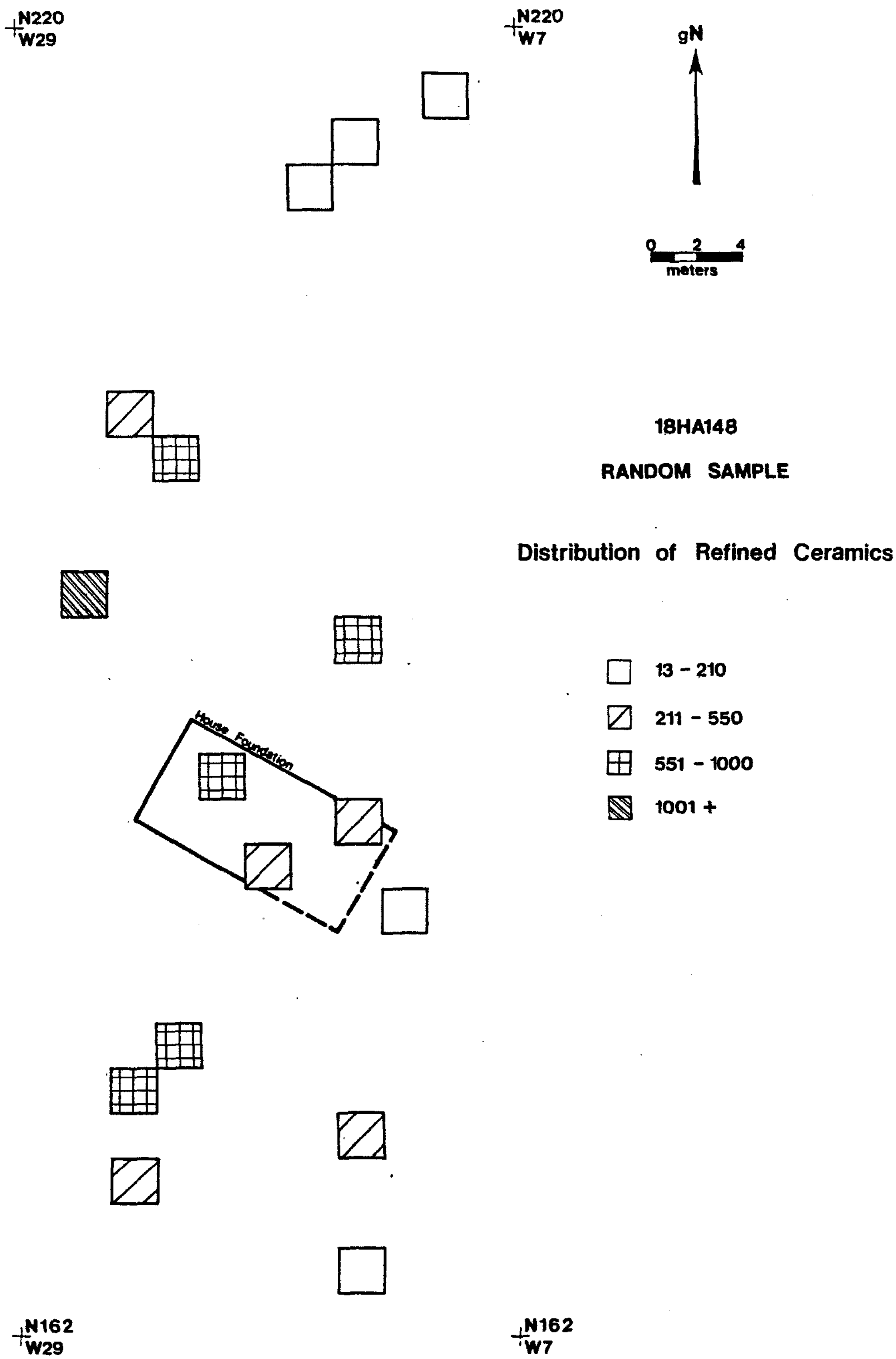


FIGURE 21. Distribution from random tests - Refined ceramics.

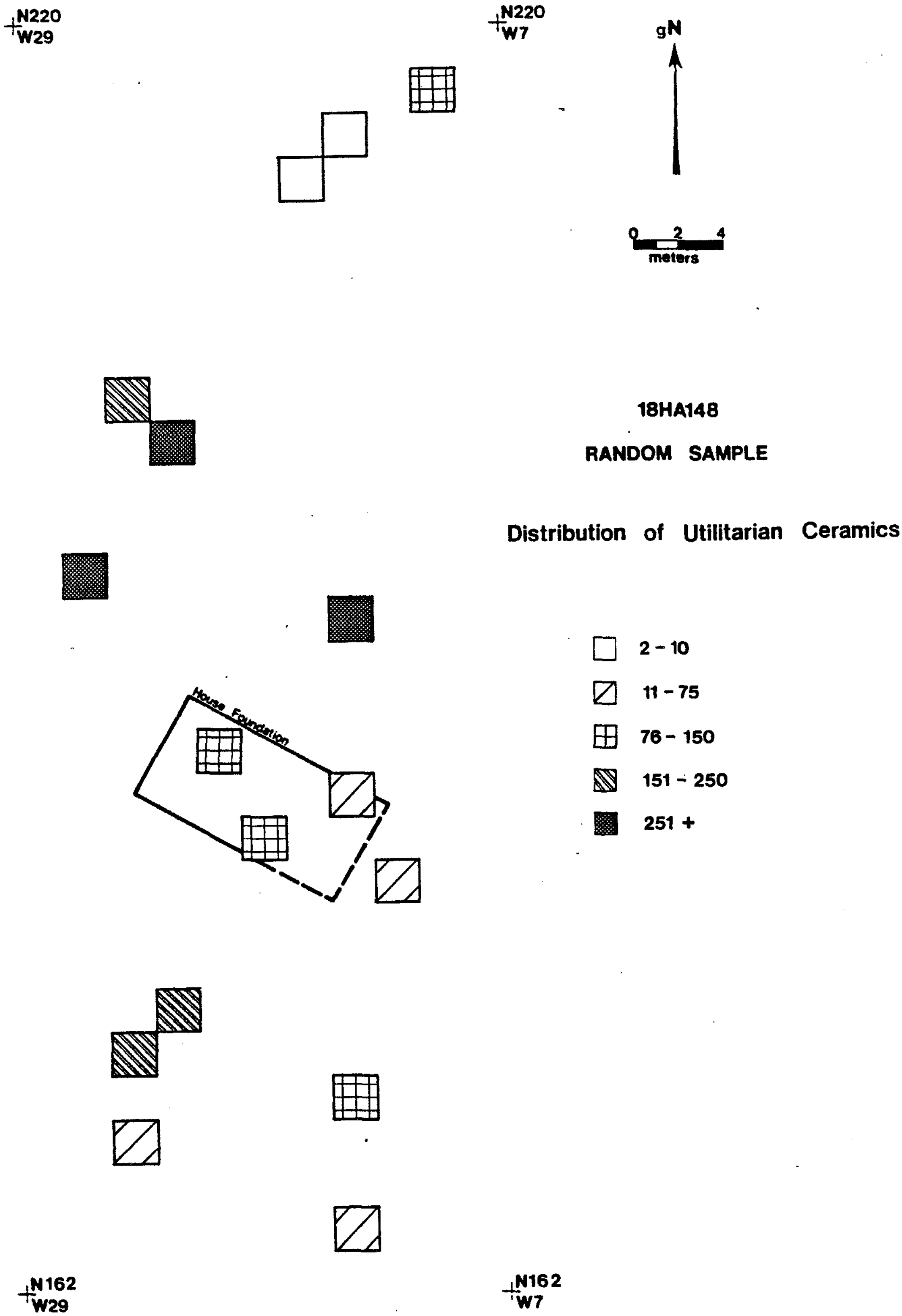


FIGURE 22. Distribution from random tests - Utilitarian ceramics.

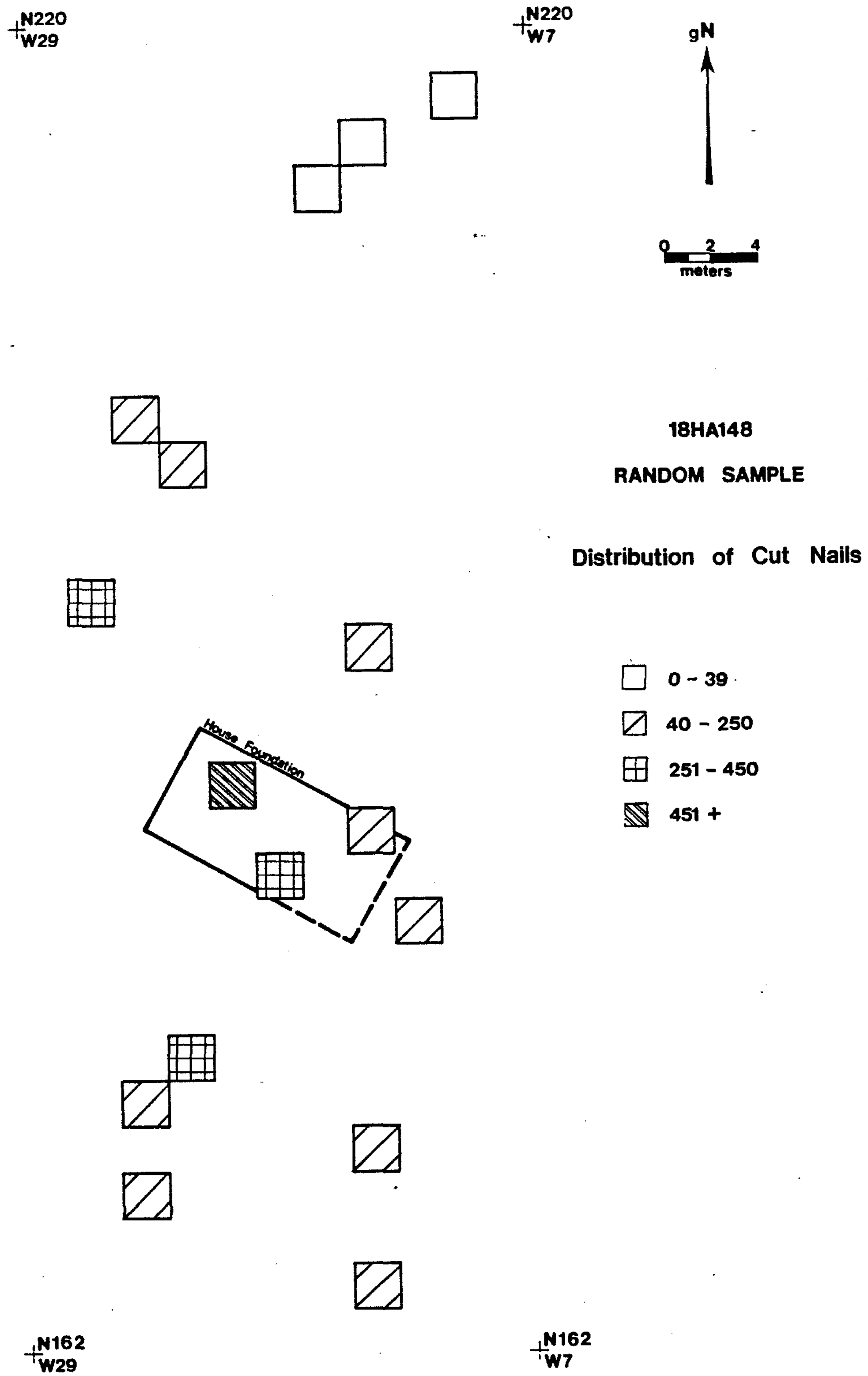


FIGURE 23. Distribution from random tests - Cut nails.

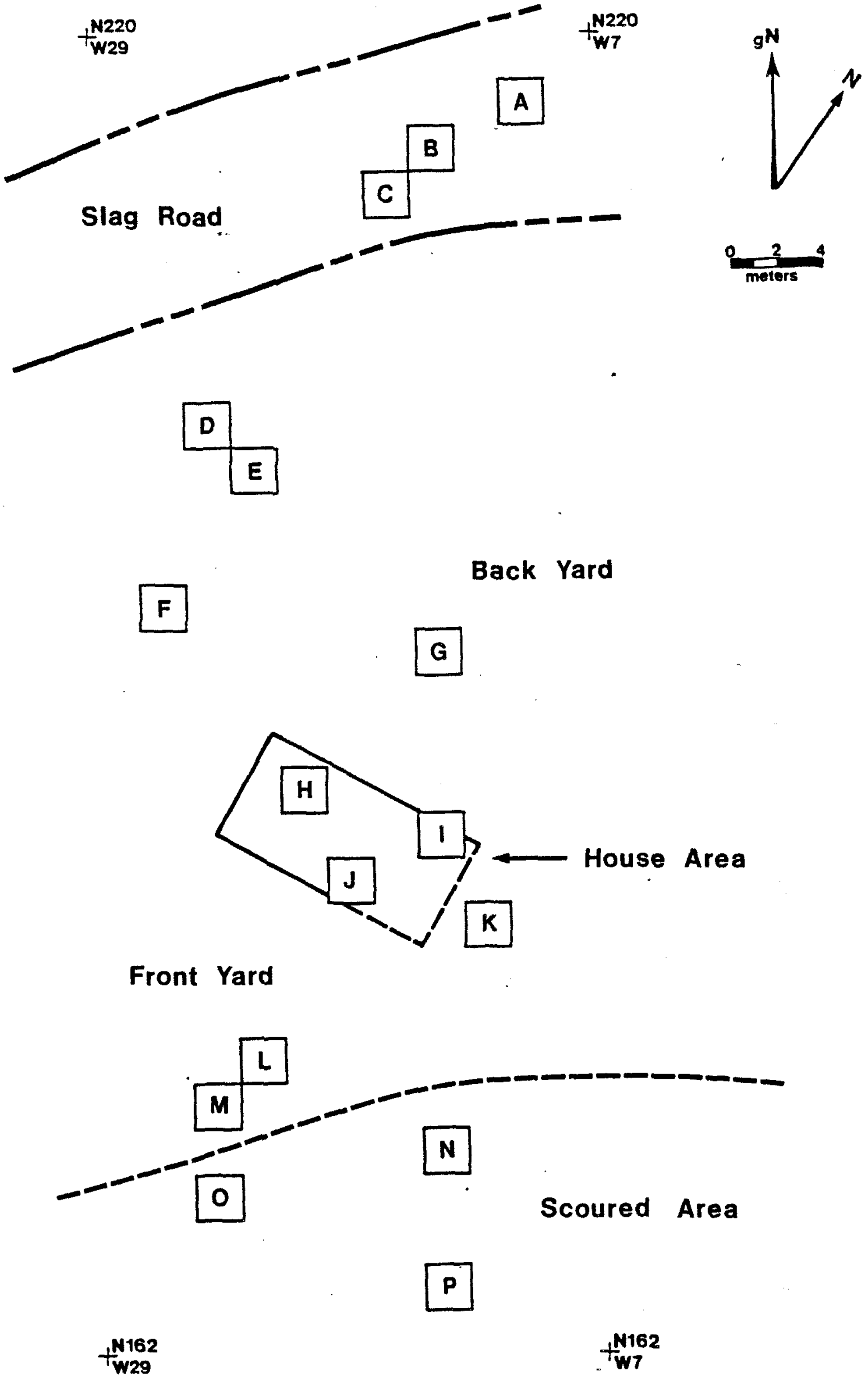


FIGURE 24. Interpretation of distributional analyses.

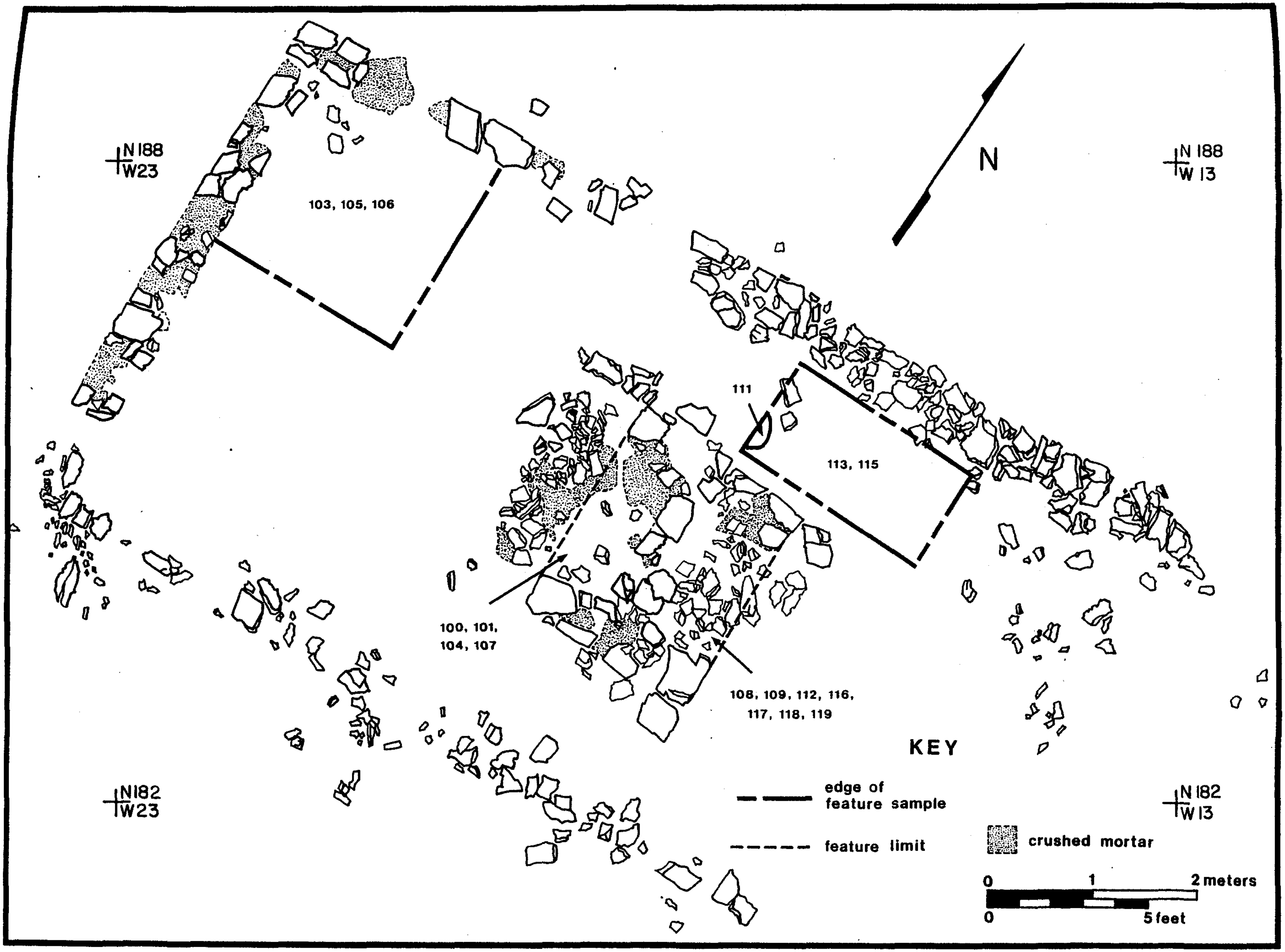


FIGURE 25. Plan view of foundation and house features.

quantity of nails recovered, the building was probably one and a half or two stories and of frame construction.

To sample the architectural features, four areas were excavated. Both the east hearth and west hearth were investigated with controlled, stratified excavation. The west hearth contained four discernible layers (Features 100, 101, 104, and 107) while the east hearth yielded seven layers (Feature 108, 109, 112, 116, 117, 118, and 119) (see Table 4 and Figure 25). All of these layers have been interpreted as demolition fills, given the admixture of building material and burned nails. Neither of the hearth beds were preserved *in situ*, suggesting intentional disassembly at the time of site abandonment. In the northwest corner of the foundation, a 2 m square excavation unit was undertaken to investigate an apparent displaced subsoil horizon (Figure 25) (Features 103 and 105). This displaced subsoil was the result of excavating the footer trench which held the roughly dressed stone foundation. It appears that the spoil from this trench was mounded inside the house area and then smoothed-out after the stone footer was installed. Beneath the displaced subsoil we encountered a buried "A" horizon (Feature 106) (see Table 4). This stratum proved to be sterile in terms of historic artifacts. A 1 m x 2 m excavation unit was placed north of and adjacent to the eastern hearth within the limits of the stone foundation (Figure 25, Table 4). Again, a sequence of displaced subsoil (Feature 113) and a buried "A" horizon (Feature 115) was encountered. Intrusive through both of these layers was a roughly oval soil feature (Feature 111). It is hypothesized that this feature (111) represents a support for a stair which would have been attached to the central chimney stack. This feature contained a sherd with part of a bottom mark from the Job and John Jackson Pottery Company of Staffordshire U.K. which was in business from 1831 to 1835 (Godden 1964:349). This provides a relatively close date for the initial construction of the building and fits reasonably well with the historic data on when the company acquired the property.

Based on architectural analogy, the structure appears to represent a two celled industrial workers' "duplex" (Ridout, personal communication 1987). Such structures are not uncommon at industrial complexes and would have provided housing for two families working at the ironworks. Again, based on architectural analogy one would assume a door or doors located in the center of the "front" (south end) and the "back" (north) end. These would have provided access to the "front" (south) yard and a rear or "back" (north) yard service area.

The non-architectural sub-plow zone features uncovered at Harford Furnace fall into seven principal classes: planting holes or beds, lithic concentrations, postholes and postmolds, a privy, drainage trenches, the previously mentioned slag "road," and a large trash-filled relict creek channel. The planting features can be further subdivided into "front yard" (south of the structure) and "back yard" (north of the structure). Two distinct fence lines north of the structure can also be isolated.

The front yard planting features include a tree throw (Feature 73), three small features which, although appearing to have been dug by humans, have root molds extending outward (Features 67, 71, 74, and 86), two irregularly circular planting beds (Features 65 and 72), and one linear planting bed (66) (Figure 26, Table 5). The asymmetrical arrangement of these features may be a function of differences in age. They could represent successive generations of planting that would not be reflected in either the *termini post quem* or mean ceramic dates, as the material included in their fills probably represents redeposited yard debris rather than primary deposition.

TABLE 4. Attributes of house features.

feature #	length (cm)	width (cm)	thickness (cm)	bottom elev. (meters A.S.L.)	primary fill	secondary fill	t.p.q.	m.c.d.	interpertation
100	66	62	13.50	21.585	10YR 2/1 silt loam	7.5YR 3/2 sandy loam	1805		west hearth fill
101	130	80	8.50	21.625	10YR 3/2 silt loam	none	1820	1850.58	west hearth fill
104	100	66	7.50	21.510	10YR 4/6 silty clay	none	1820	1855.00	west hearth fill
107	100	66	17.00	21.340	2.5YR 3/2 sandy loam	none			west hearth fill
108	105	65	17.00	21.465	10YR 3/3 sandy loam	none	1820	1855.00	east hearth fill
109	200	45	11.50	21.520	10YR 3/3 silt loam		1830	1850.17	east hearth fill
112	70	60	7.50	21.545	10YR 6/8 sandy loam	2.5YR 5/6 sandy loam	1805		east hearth fill
116	120	80	8.00	21.520	10YR 6/8 sandy loam	2.5YR 5/6 sandy loam			east hearth fill
117	70	60	21.00	21.370	10YR 3/3 sandy loam	10YR 4/6 loam	1830	1845.00	east hearth fill
118	120	80	7.50	21.525	10YR 3/3 sandy loam	10YR 4/6 loam	1830	1850.00	east hearth fill
119	200	45	25.50	21.360	10YR 3/3 sandy loam	2.5YR 3/2 loam	1840	1854.27	east hearth fill
103	200	200	10.00	21.540	7.5YR 4/6 clay	10YR 3/1 slt cly loam	1830	1853.19	displaced subsoil
105	200	200	11.00	21.430	2.5YR 5/4 clay	7.5YR 5/8 sand	1820	1855.00	displaced subsoil
106	200	200	11.50	21.315	2.5YR 3/2 sandy loam	none			buried A
111	50	22	17.00	21.470	10YR 2/2 silt loam	none	1830	1845.00	stair support
113	200	100	5.00	21.650	10YR 5/8 clay	none	1831	1855.00	const. fill
115	200	100	9.00	21.350	10YR 3/3 silt	none			buried A

t.p.q. = terminus post quem   m.c.d. = mean ceramic date

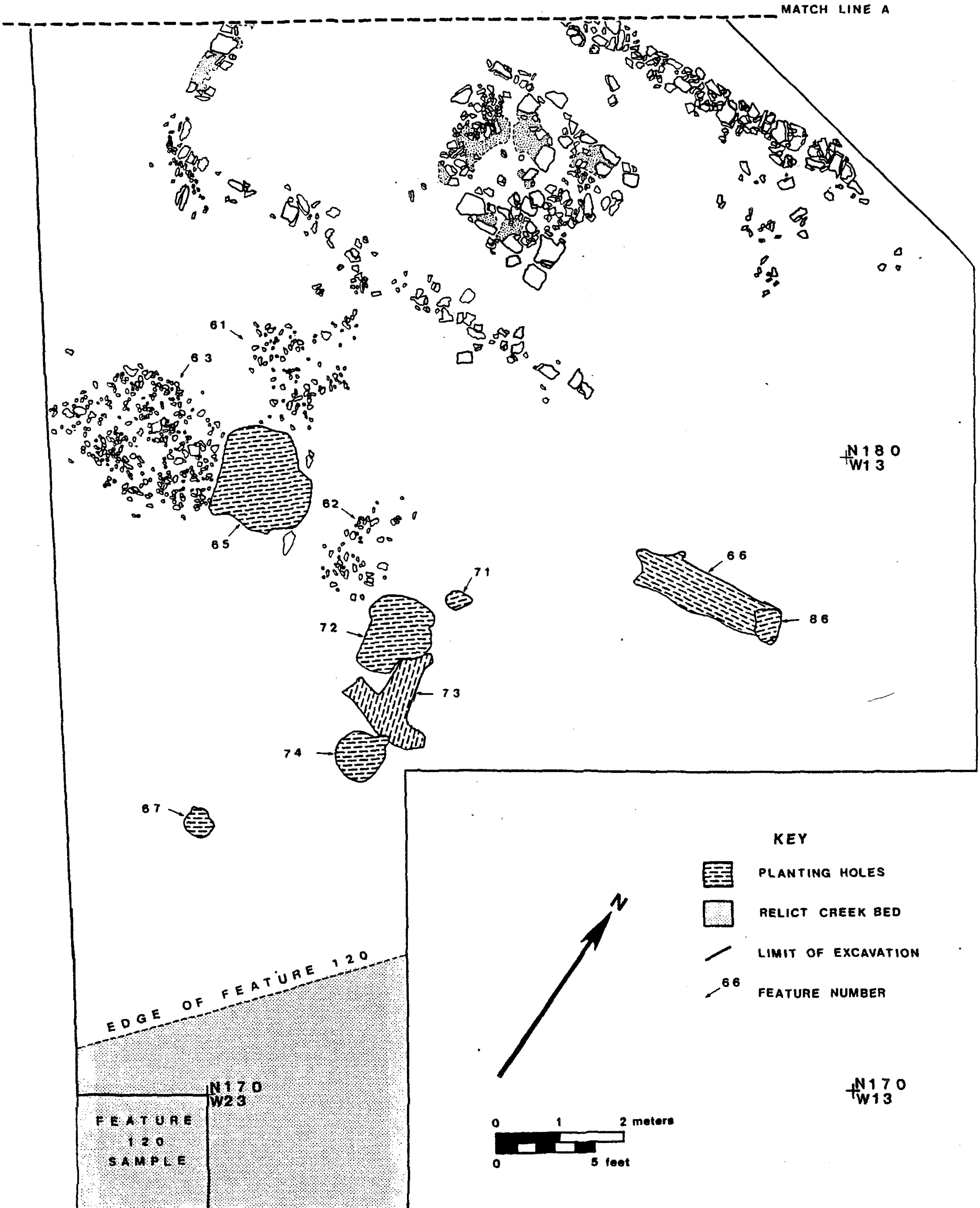


FIGURE 26. Plan view of front yard.

TABLE 5. Attributes of front yard planting features.

feature #	length (cm)	width (cm)	thickness (cm)	bottom elev. (meters A.S.L.)	primary fill	secondary fill	t.p.q.	m.c.d.
65	149	147	23.00	21.053	10YR 2/1 silt loam	2.5YR 5/2 silt loam	1840	1852.92
66	250	66	4.50	21.390	2.5YR 3/2 sand	2.5YR 4/4 sandy loam	1840	1853.94
67	49	49	9.50	21.390	2.5YR 3/2 silt loam	2.5YR 4/4 sandy loam	1830	1852.00
71	36	35	5.00	21.180	10YR 3/2 silt loam	10YR 5/4 silt	1830	1854.00
72	135	97	22.50	21.070	10YR 3/2 silt loam	10YR 6/6 sand	1837	1852.67
73	150	140	34.00	20.870	10YR 3/2 silt loam	2.5YR 3/2 silt loam	1840	1857.07
74	80	75	12.50	21.020	10YR 2/2 silt loam	2.5YR 5/4 sandy loam	1830	1852.93
86	55	41	7.00	21.320	10YR 3/3 sandy loam	2.5YR 5/4 sand	1830	1850.00
average	113.00	81.19	14.75	21.162				
minimum	36.00	35.00	4.50	20.870				
maximum	250.00	147.00	34.00	21.390				

t.p.q. = terminus post quem   m.c.d. = mean ceramic date

In and amongst the front yard planting features were three discrete lithic concentrations (Features 61, 62, and 63) (Figure 26). These features were artifactually sterile and extended into the subsoil a scant 10 cm. It has been hypothesized that these represent reduction areas for preparing the roughly dressed fieldstone used in the structural foundation and the chimney base. All of the stones in these concentrations are quite angular and could be the waste material from dressing fieldstone.

The back yard planting features are somewhat more consistent in their size and shape; however, no obvious pattern to their placement is discernible (Figure 27). The features range from 19 cm to 46 cm (7 in to 18 in) in length and 11 cm to 38 cm (4 in to 15 in) in width (Table 6). Features 35 and 88 are roughly parallel with the north-south fence lines (described below); however this may well be fortuitous. The planting features are more concentrated south of a second east-west fence line (described below); however, two of the eight back yard planting holes are north of this fence. This suggests a greater concentration of planting activity nearer the house within the delimiting east-west fence, but not an exclusive pattern of planting there.

A north-south fence (fence 1) is formed by Postholes 23, 38, and 84 and Postmolds 22, 37, and 82 (Figure 27, Table 7). Fence 1 is interpreted as a woven wire or barbed wire stock fence rather than a plank fence because of the spacing between the posts (4.1 m [12 ft]). It would appear that the fence terminated with a gate at the northwest corner of the structure. Another posthole-postmold combination (Features 91 and 92) may represent an additional fence also terminating with a gate at the northwest corner of the structure (see Figure 27, Table 7). However, additional posts which may have been associated with this fence line were outside of the research universe. Therefore, it is possible that a fence perpendicular to the north-south fence and cornering on the northwest corner of the structure existed, but conclusive evidence for it was not recovered in the course of excavation.

Fence 2 is probably a plank fence with 8 foot long panels represented by six hole/mold combinations which is parallel to the house 7.6 m (25 ft) from the structure's north side (Figure 27). The postmolds (Features 58, 69, 78, 94, 32, and 55) are on approximately 2.5 m (8 ft) centers and the associated postholes (respectively Features 17, 19, 30, 95, 33, and 43) are relatively consistent in shape, size, and nature of fill (Table 8). One of the hole/mold complexes (Features 78 and 30) had been redug with the post replacing a predecessor (Features 79 and 80). This replacement suggests that the fence was in use for some time. No evidence of a gate was recovered in the course of excavation; however, it may have been located outside of the area under investigation.

Fence line 1 and fence line 2 do not appear to be contemporaneous. This is based on the fact that they do not intersect at a common post and that they are not of similar construction. Support for diachronic use cannot be found in either fence's associated assemblage (Table 7 and 8). This is probably a function of their respective fills containing redeposited yard midden and lack of primary deposition that would reflect their construction dates. However, the very different construction techniques argue strongly for two phases of fence building.

The privy (Features 39, 57, and 70) was located roughly 3 m (10 ft) north of the structure in the back yard demarcated by the east-west fence line described above (Figure 27). The feature was 186 cm by 96 cm (6 ft x 3 ft) and contained

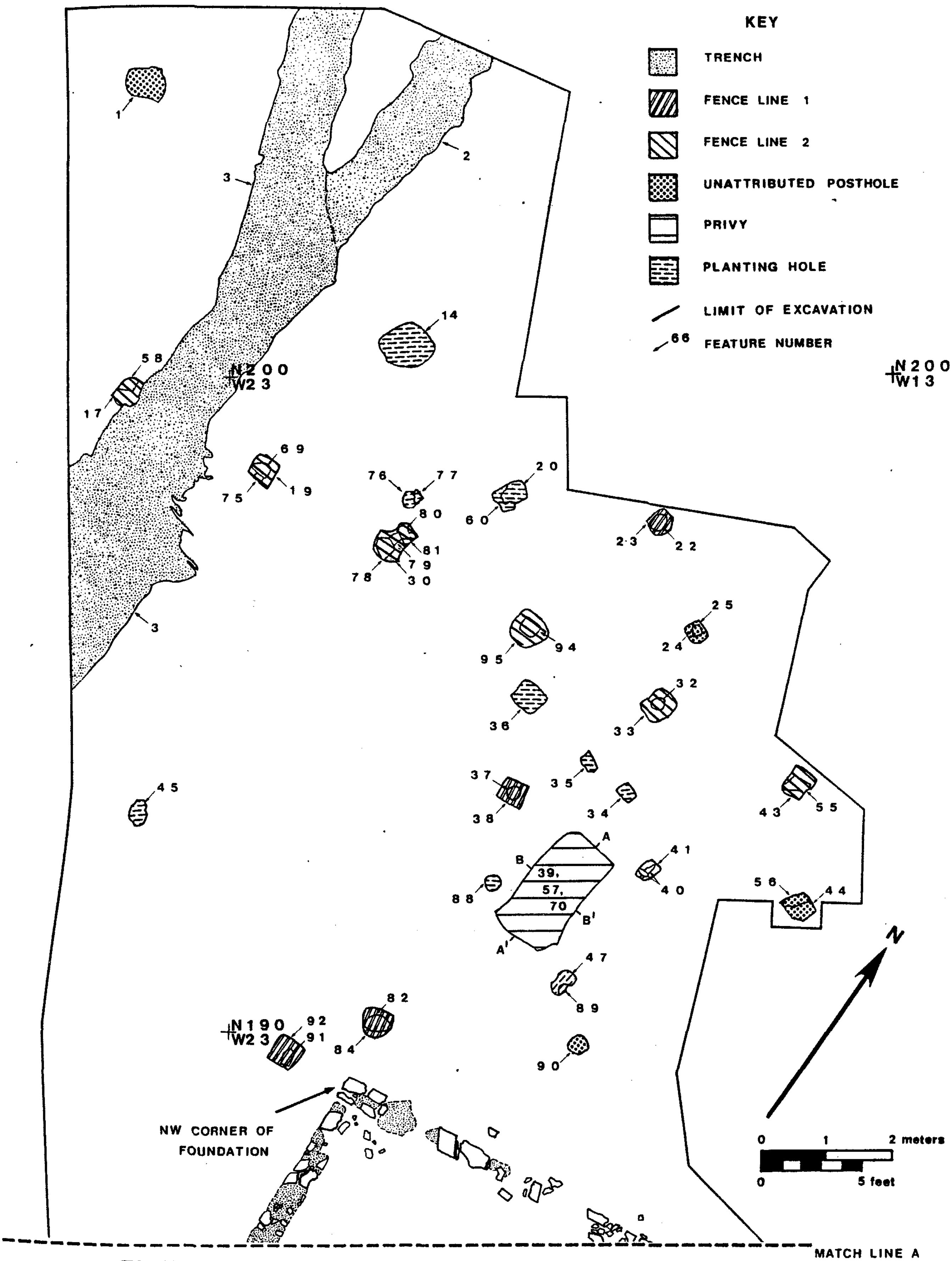


FIGURE 27. Plan view of back yard.

TABLE 6. Attributes of back yard planting features.

feature #	length (cm)	width (cm)	thickness (cm)	bottom elev. (meters A.S.L.)	primary fill	secondary fill	t.p.q.	m.c.d.
20	46	37	15.00	21.590	10YR 2/1 slt cly loam	none	1820	1854.50
34	30	20	17.50	21.395	10YR 2/2 silt loam	2.5YR 4/4 sandy loam	1830	1845.00
35	28	21	15.50	21.575	10YR 2/1 silt loam	10YR 5/4 sandy loam	1830	1848.33
36	43	38	43.00	21.495	10YR 5/4 sandy loam	10YR 3/2 silt loam		
45	44	33	21.00	21.430	10YR 3/3 silt loam	none	1830	1847.22
47	39	29	16.50	21.580	10YR 4/6 clay	10YR 2/2 silt loam	1805	
77	19	18	17.00	21.120	10YR 3/2 clay loam	7.5YR 3/4 sandy loam	1830	1852.00
88	27	24	18.00	21.680	2.5YR 4/4 sandy loam	10YR 2/2 silt loam		
89	28	11	16.50	21.615	10YR 2/2 silt loam	10YR 2/1	1805	
average	33.72	25.39	20.00	21.498				
minimum	18.50	10.50	15.00	21.120				
maximum	46.00	38.00	43.00	21.680				

t.p.q. = terminus post quem m.c.d. = mean ceramic date

TABLE 7. Attributes of north-south fence line.

post molds

feature #	length (cm)	width (cm)	thickness (cm)	bottom elev. (meters A.S.L.)	primary fill	secondary fill	t.p.q.	m.c.d.	associated post hole
22	28	24	34.00	21.370	10YR 3/3 clay loam	none	1830	1845.00	23
37	13	13	34.00	21.375	10YR 3/2 silt loam	none	1830	1852.14	38
82	33	30	68.00	21.110	10YR 2/2 silt loam	none	1840	1852.04	84
average	24.67	22.33	45.33	21.285					
minimum	13.00	13.00	34.00	21.110					
maximum	33.00	30.00	68.00	21.375					

post holes

feature #	length (cm)	width (cm)	thickness (cm)	bottom elev. (meters A.S.L.)	primary fill	secondary fill	t.p.q.	m.c.d.	associated post mold
23	37	34	36.00	21.400	10YR 4/3 loam	10YR 6/6 sandy loam	1830	1852.40	22
38	40	37	36.00	21.355	10YR 2/2 silt loam	10YR 5/6 clay	1830	1852.23	37
84	53	45	52.00	21.050	10YR 3/2 silt loam	10YR 6/6 sandy loam	1840	1851.95	82
average	43.33	38.67	41.33	21.268					
minimum	37.00	34.00	36.00	21.050					
maximum	53.00	45.00	52.00	21.400					

possibly associated post hole and mold

feature #	length (cm)	width (cm)	thickness (cm)	bottom elev. (meters A.S.L.)	primary fill	secondary fill	t.p.q.	m.c.d.	interpretation
91	38.00	18.00	45.00	20.970	10YR2/2 silt loam	none	1830	1841.75	post mold
92	48.00	41.00	55.00	20.890	10YR 3/4 sandy loam	10YR 5/4 sandy loam			post hole

t.p.q. = terminus post quem   m.c.d. = mean ceramic date

TABLE 8. Attributes of east-west fence line.

post molds feature #	length (cm)	width (cm)	thickness (cm)	bottom elev. (meters A.S.L.)	primary fill	secondary fill	t.p.q.	m.c.d.	associated post hole
32	32	23	46.00	21.280	10YR 3/3 silt loam	10YR 3/1 slt cly loam	1840	1856.00	33
55	40	24	47.50	21.285	10YR 3/2 silt loam	10YR 5/8 clay loam	1830	1852.50	43
58	24	22	28.00	21.220	10YR 2/1 silty clay	none	1820	1855.00	17
69	30	18	32.00	21.310	10YR 3/3 silt	2.5YR 4/4 sand	1840	1855.31	19
78	30	26	28.00	21.190	10YR 3/3 slt cly loam	10YR 2/1	1820	1855.00	30
94	18	18	35.00	21.280	10YR 3/2 silt loam				95
average	29.00	21.83	36.08	21.261					
minimum	18.00	18.00	28.00	21.190					
maximum	40.00	26.00	47.50	21.310					

post holes feature #	length (cm)	width (cm)	thickness (cm)	bottom elev. (meters A.S.L.)	primary fill	secondary fill	t.p.q.	m.c.d.	associated post mold
17	44	41	28.00	21.320	2.5YR 5/4 sandy loam	10YR 5/6 silty clay	1840	1856.25	58
19	44	40	32.00	21.310	10YR 3/3 sandy loam	10YR 5/6 silty clay	1830	1853.56	69
30	65	50	50.00	21.300	10YR 3/3 slt cly loam	10YR 2/2 slt cly loam	1830	1851.50	78
33	50	39	44.00	21.300	10YR 5/6 sandy loam	10YR 3/3 silt loam	1830	1854.44	32
43	45	37	47.50	21.285	10YR 5/8 sandy loam	10YR 3/2 silt loam	1875	1848.70	55
95	52	51	36.00	21.280	2.5YR 4/4 silt loam	2.5YR 4/2 clay	1805		94
average	50.00	43.00	39.58	21.299					
minimum	44.00	37.00	28.00	21.280					
maximum	65.00	51.00	50.00	21.320					

redug posts feature #	length (cm)	width (cm)	thickness (cm)	bottom elev. (meters A.S.L.)	primary fill	secondary fill	t.p.q.	m.c.d.	interpretation
79	48	22	29.00	21.210	10YR 5/6 sndy cly loam	10YR 3/3 sandy loam	1820	1855.00	post hole
80	25	?	17.00	21.360	10YR 3/2 silt loam	10YR 4/4 sand	1830	1850.50	post mold
81	37	21	18.00	21.350	10YR 3/3 silt loam	2.5YR 4/4 sndy cly loam			post hole

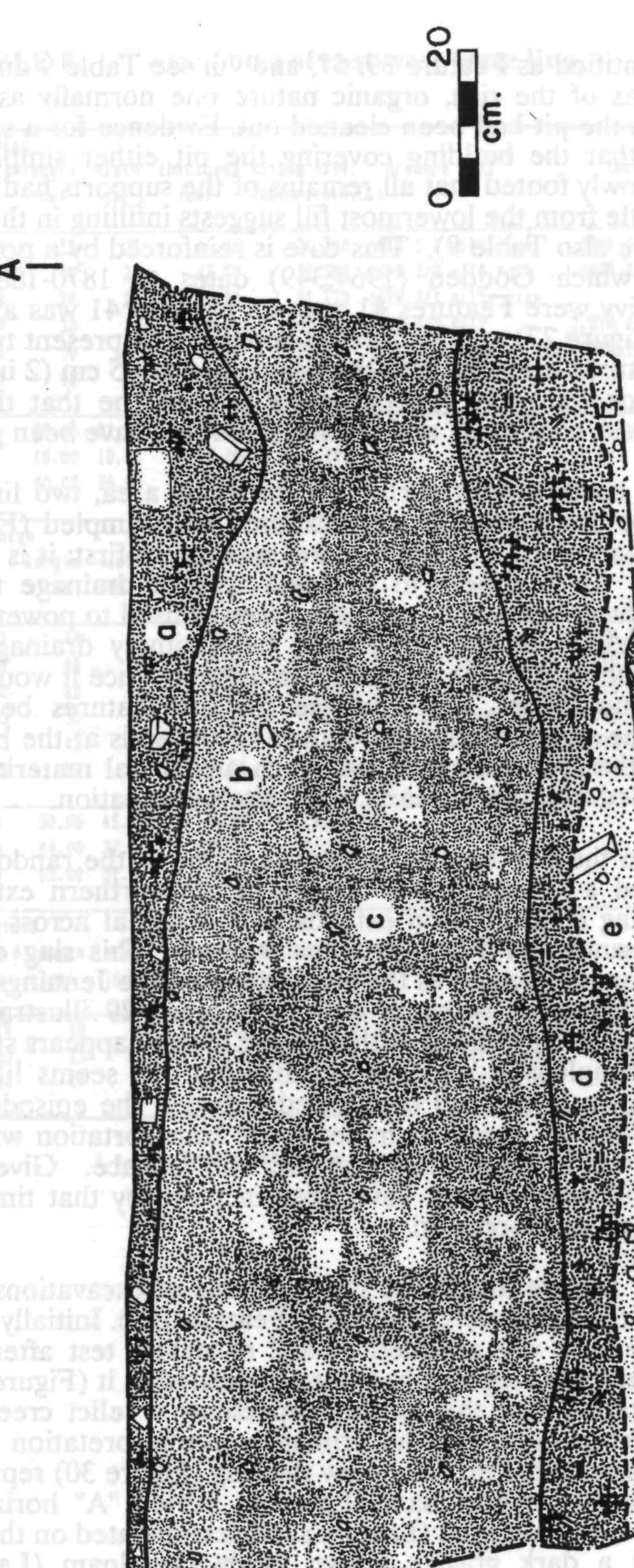
t.p.q. = terminus post quem   m.c.d. = mean ceramic date

three distinct fills (identified as Feature 39, 57, and 70: see Table 9 and Figure 28). None of these fills was of the rich, organic nature one normally associates with privies, suggesting that the pit had been cleaned out. Evidence for a superstructure was scant suggesting that the building covering the pit either simply sat on the surface or was so shallowly footed that all remains of the supports had been plowed away. A complete bottle from the lowermost fill suggests infilling in the last quarter of the 19th century (see also Table 9). This date is reinforced by a pottery mark of J. Jackson and Co. which Godden (1964:349) dates to 1870-1886. Possibly associated with the privy were Features 41 and 40. Feature 41 was a very shallow subrectangular hole (Figure 27) and Feature 40 appears to represent two boards set in the hole. These features extended into the subsoil a scant 5 cm (2 in). If they do represent a support for the privy superstructure it could be that the analogous features on the northwest, southwest, and southeast corners have been plowed away.

In the extreme northwestern portion of the study area, two linear features which merged into one linear feature were exposed and sampled (Figure 27 and Table 10). It is not clear which of these features was in use first: it is possible they are contemporaneous. Both appear to be some type of drainage trench. It is possible they were spillways associated with the raceway used to power the air blast at the furnace (see below) or they may have been simply drainage ditches to eliminate water from the area of the domestic occupation since it would have been subject to frequent inundation. The evidence for the features being drainage trenches is primarily the waterlain mottled nature of the soils at the bottom of the trenches. Neither of the features contained much artifactual material, suggesting they may have been filled in relatively early in the site's occupation.

As mentioned in the unit excavations above, three of the randomly placed 2 m squares encountered a concentration of slag in the northern extreme of the research area. This slag concentration extends as a diagonal across the northern end of Area 1 (see Landscape Reconstruction below). This slag concentration appears in roughly the same location as the access road on the Jennings and Herrick map of 1858 (see cartographic research above). Figure 29 illustrates a typical profile through the slag concentration. Although the feature appears stratified, very little difference in chronology is apparent (Table 11). It seems likely that the roadbed was laid down in layers and compacted between the episodes of paving. Slag would have provided an excellent material for transportation with iron-shod wheeled vehicles and was in ready supply at the iron furnace. Given the road's appearance on the 1858 map, it must have been in place by that time. However, subsequent repaving may have occurred.

The final major feature uncovered in the course of excavations was a relict creek channel south of the structure's front yard (Feature 120). Initially encountered in Test Unit O, the feature was sampled by a 2 m square test after mechanical removal of a large quantity of slag that had been deposited in it (Figure 30, Layers f and g). The interpretation that this feature represents a relict creek channel is based upon several lines of reasoning but primarily on interpretation of soils data. The sequence of soils seen in the profile below the slag (Figure 30) represents, from right to left: a dark brown sandy loam (Layer k: buried "A" horizon); a dark yellowish brown loamy waterlain sand (Layer j: sand accumulated on the edge of the old stream bed); and a dark grayish brown sandy clay loam (Layer i: creek sediments). In addition, numerous large water worn cobbles were encountered at the bottom of the feature.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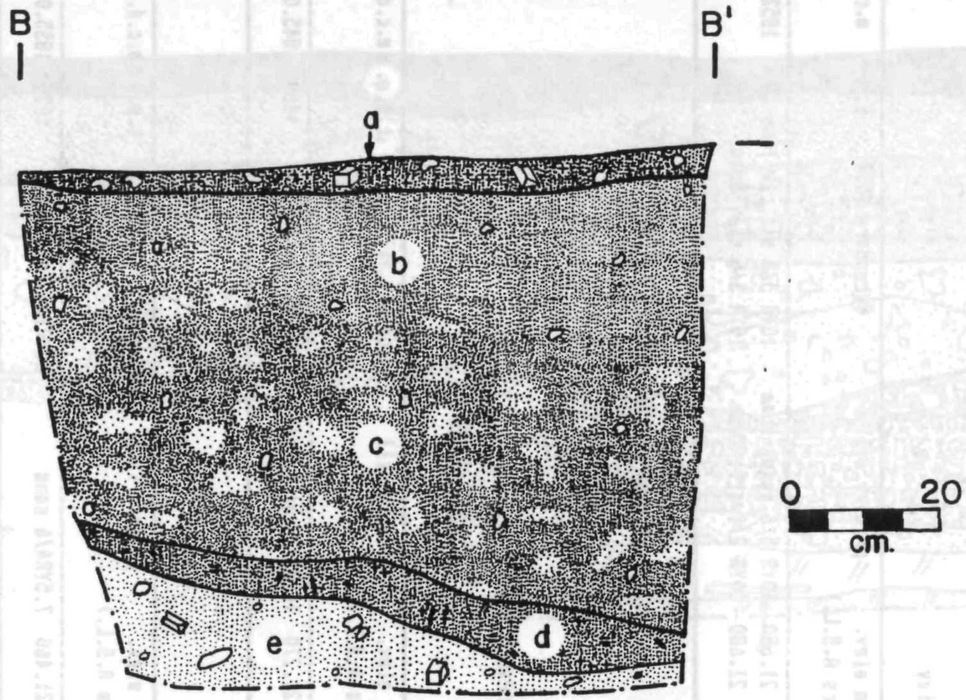


a = black (10YR2/1) silt loam with scattered brick fragments, charcoal flecks and slag (privy fill) - Feature 39
b = very dark brown (10YR2/2) silty clay loam with slag, grading into layer c (privy fill) - Feature 57
c = very dark brown (10YR2/2) silt loam mottled with olive brown (2.5Y4/4) silt (privy fill) - Feature 57
d = black (10YR2/1) clay loam with charcoal flecks (privy fill) - Feature 70
e = olive brown (2.5Y4/4) compact loamy sand with rocks and brick fragments (privy fill) - Feature 70
f = dark brown (7.5YR3/2) compact sand with burned brick fragments (privy fill) - Feature 70

FIGURE 28. Profiles of privy.

TABLE 9. Attributes of privy and boardmolds.

Privy

feature #	length (cm)	width (cm)	thickness (cm)	bottom elev. (meters A.S.L.)	primary fill	secondary fill	t.p.q.	m.c.d.
39	186	96	25.40	21.680	10YR 2/2 clay loam	none	1870	1854.51
57	181	92	67.50	21.010	10YR 3/2 silt loam	10YR 5/3 none	1840	1852.50
70	167	82	9.00	20.950	10YR 2/1 slt cly loam	10YR 5/5 sandy loam	1840	1855.31

Board Molds and Hole Associated with Privy

feature #	length (cm)	width (cm)	thickness (cm)	bottom elev. (meters A.S.L.)	primary fill	secondary fill	t.p.q.	m.c.d.
41	39	23	5.00	21.680	10YR 5/6 sandy loam	10YR 5/8 slt cly loam	1830	1852.00
40	30	5	5.00	21.680	10YR 2/1 silt loam	10YR 5/6 clay loam		

t.p.q. = terminus post quem m.c.d. = mean ceramic date

TABLE 10. Attributes of trench features.

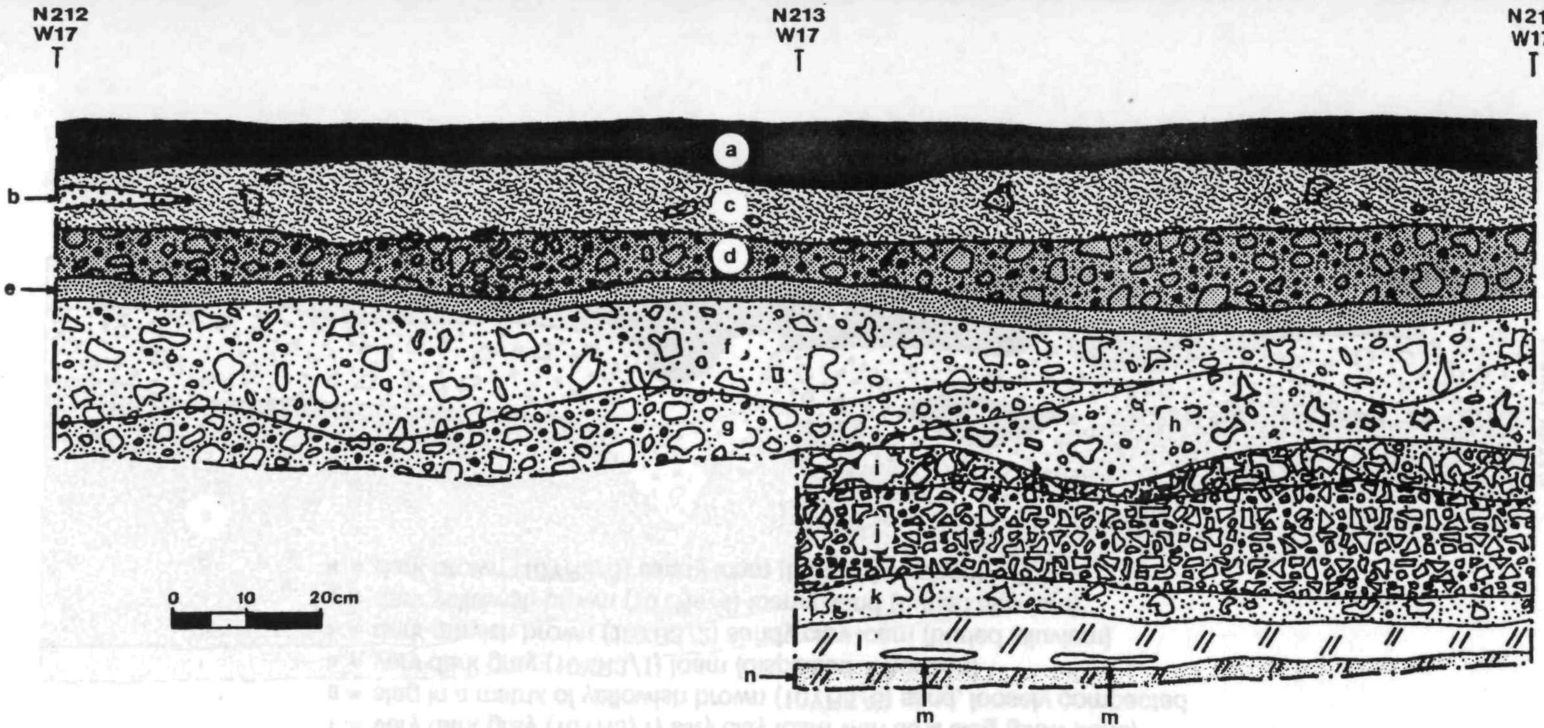
trench 1

feature #	length (cm)	width (cm)	thickness (cm)	bottom elev. (meters A.S.L.)	primary fill	secondary fill	t.p.q.	m.c.d.
2	61	50	35.00	21.270	10YR2/2 silt loam	10YR2/1 silt loam	1800	1845.00

trench 2

feature #	length (cm)	width (cm)	thickness (cm)	bottom elev. (meters A.S.L.)	primary fill	secondary fill	t.p.q.	m.c.d.
3	516	105	23.00	21.460	7.5YR4/6 sand	10YR2/1 silt loam	1820	1855.00

t.p.q. = terminus post quem m.c.d. = mean ceramic date



a = black (10YR2/1) silt loam (humus) - Level 1
b = dark brown (10YR3/3) coarse sand (lens)
c = black (10YR2/1) sandy loam with occasional slag (A horizon) - Level 2
d = black (7.5YR2/0) sandy loam with 80% glassy slag (fill) - Level 3
e = very dark grayish brown (10YR3/2) sandy loam, discontinuous pockets on southern end (flood deposit?) - Level 4
f = very dark gray (10YR3/1) sandy loam with 50% slag (fill) - Level 5
g = very dark gray (10YR3/1) sandy loam with 75% slag (fill) - Level 6
h = dark brown (7.5YR3/2) compact sandy loam with 40% slag (fill) - Level 6
i = very dark gray (7.5YR3/0) extremely compact sandy loam with 90% slag (fill) - Level 7
j = very dark gray (7.5YR3/1) sandy loam with 95% iron slag (fill) - Level 8
k = very dark gray (10YR3/1) sandy loam with 20% slag (fill) - Level 9
l = dark gray to very dark gray (5Y4/1 to 5Y3/1) clay (subsoil) - Level 10
m = dark grayish brown (2.5Y4/2) clay (lenses in subsoil)
n = very dark grayish brown (2.5Y3/2) silty clay (subsoil) - Level 11

FIGURE 29. Profile of slag road - Test Unit C.

KEY TO FIGURE 30

a = dark brown (10YR3/3) sandy loam (alluvium)
b = very dark grayish brown (10YR3/2) silt loam (alluvium, new A horizon)
c = dark yellowish brown (10YR4/4) loamy sand (alluvium)
d = very dark gray (10YR3/1) sandy loam mottled with 40% dark brown (10YR3/3) silt loam (mixed alluvium and A horizon)
e = very dark grayish brown (10YR3/2) silt loam (mixed alluvium and A horizon)
f = very dark gray (10YR3/1) silty clay loam with 50% slag (plow zone)
g = slag in a matrix of yellowish brown (10YR5/6) sand, loosely compacted
h = very dark gray (10YR3/1) loam (displaced A horizon)
i = dark grayish brown (10YR3/2) sandy clay loam (buried alluvium)
j = dark yellowish brown (10YR4/4) loamy sand (buried alluvium)
k = dark brown (10YR3/3) sandy loam (buried A horizon)

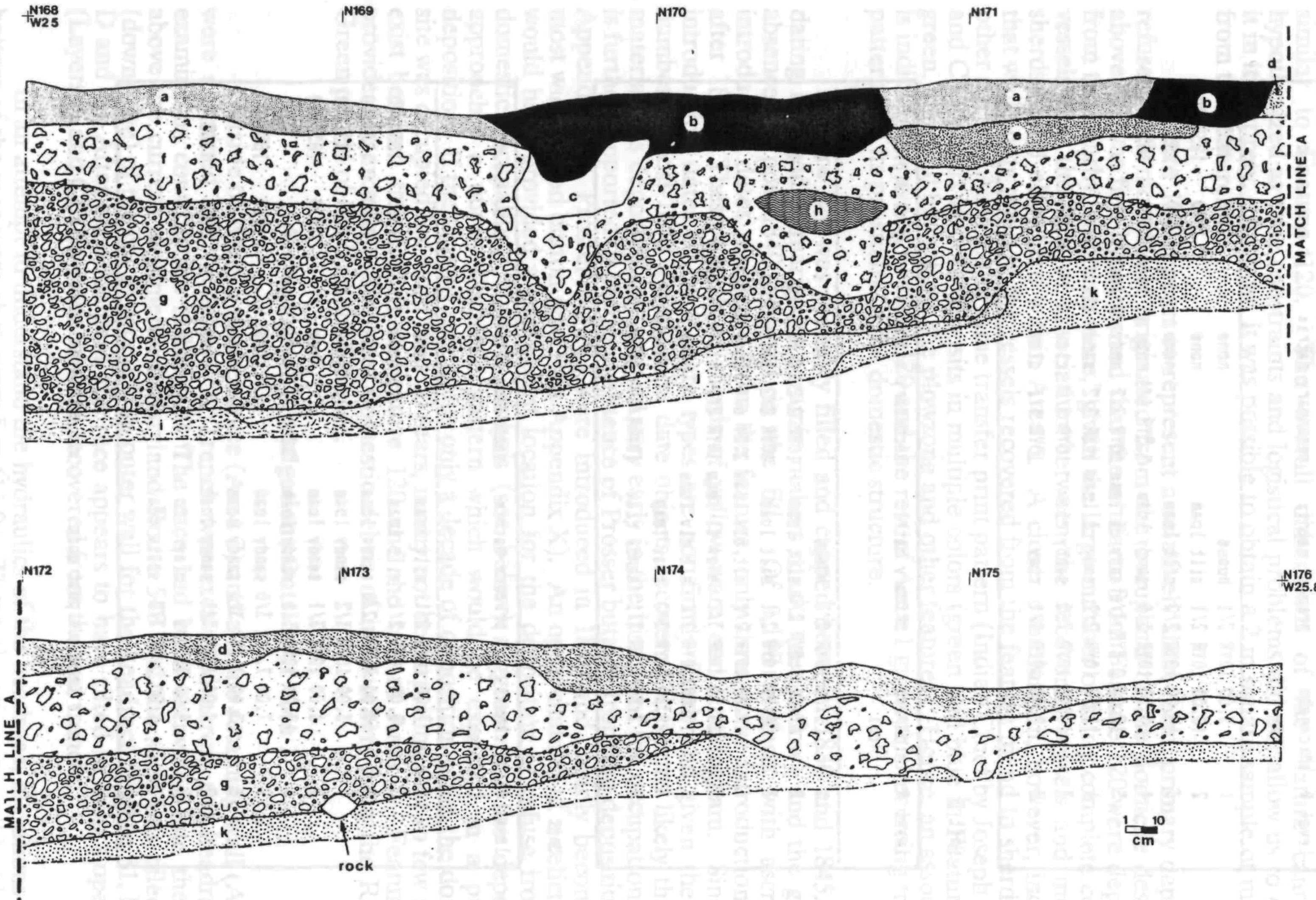


FIGURE 30. Profile of relict creek bed (Feature 120).

TABLE 11. Attributes of slag road.

Unit A

level #	thickness (cm)	primary matrix		secondary matrix		t.p.q.	m.c.d.
1	5.00	10YR 2/1	humus		none	1898	1855.00
2	18.00	10YR 2/1	silt loam		none	1840	1859.80
3	10.00	10YR 2/2	silt loam		none	1840	1853.90
4	10.50	10YR 3/4	sandy loam	7.5YR 4/4	sndy cl loam	1820	1855.00
5	12.00	2.5YR 3/6	sndy cl loam	10YR 2/2	sndy cl loam		
6	11.50	10YR 2/2	sndy cl loam	10YR 2/2	sandy clay		
7	10.00	10YR 2/2	sandy clay	10YR 5/4	clay		
8	9.00	10YR 4/1	clay	10YR 4/1	clay		

Unit B

level #	thickness (cm)	primary matrix		secondary matrix		t.p.q.	m.c.d.
1	6.00	10YR 2/1	humus		none	1820	1855.00
2	17.00	7.5YR 2/0	silt loam	10YR 2/2	silt loam	1820	1855.00
3	18.00	10YR 2/1	silt loam	10YR 3/2	sandy loam		
4	14.00	10YR 2/1	slt cly loam	2.5Y 6/4	sndy cl loam		
5	13.50	10YR 3/1	sndy cl loam	10YR 2/1	slt cly loam		
6	10.50	10YR 2/1	slt cly loam		none		
7	9.00	10YR 2/2	clay loam		none		
8	7.50	10YR 3/1	sandy clay	10YR4/6	silty clay		

Unit C

level #	thickness (cm)	primary matrix		secondary matrix		t.p.q.	m.c.d.
1	7.00	10YR 2/1	silt loam		none		
2	8.00	10YR 2/1	silt loam		none	1820	1855.00
3	10.00	7.5YR 2/0	sandy loam		none	1820	1855.00
4	3.00	10YR 3/2	sandy loam		none	1830	1851.30
5	6.00	10YR 3/1	sandy loam		none	1820	1855.00
6	12.00	10YR 3/1	sandy loam	7.5YR 3/2	sandy loam		
7	7.00	7.5YR 3/0	sandy loam		none	1820	1855.00
8	13.00	7.5YR 3/1	sandy loam		none		
9	4.00	10YR 3/1	sandy loam		none	1820	1855.00
10	4.00	5Y 4/1	clay to	5Y 3/1	clay		
11	2.00	2.5Y 3/2	silty clay		none		

t.p.q. = terminus post quem   m.c.d. = mean ceramic date

Additional support for the interpretation comes from the fact that the feature parallels the current channel of James Run, and that between the feature and the current channel of James Run is an unfilled relict creek channel, which appears similar to Feature 120. The overall dimensions of the feature cannot be hypothesized as time constraints and logistical problems did not allow us to expose it in its entirety. However, it was possible to obtain a 2 m square sample of material from the feature.

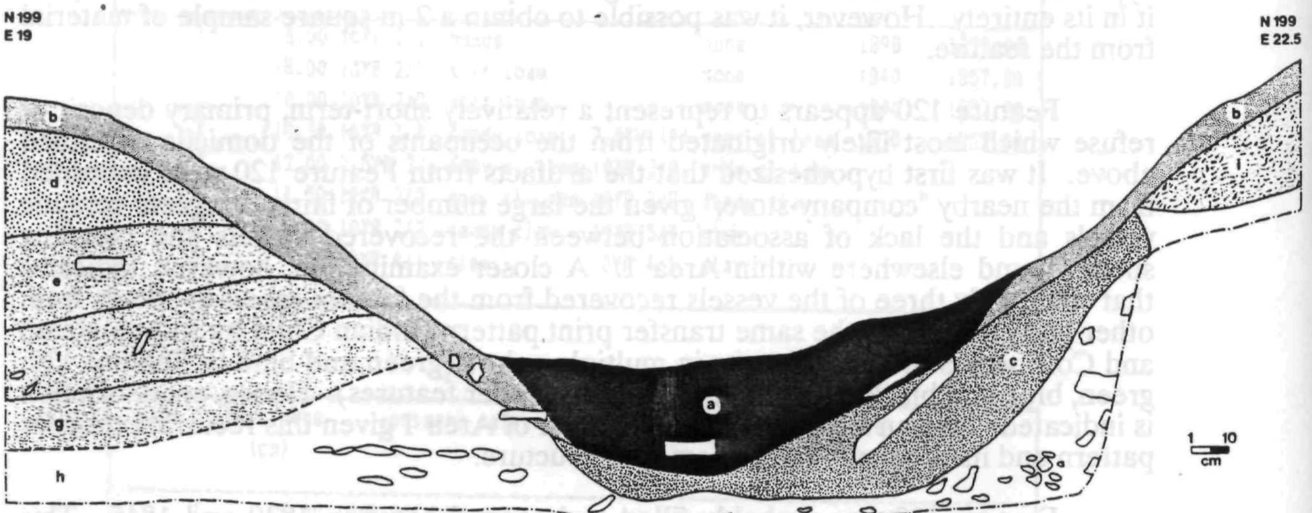
Feature 120 appears to represent a relatively short-term, primary deposit of refuse which most likely originated from the occupants of the domicile described above. It was first hypothesized that the artifacts from Feature 120 were deposited from the nearby "company store," given the large number of fairly complete ceramic vessels and the lack of association between the recovered vessels and mending sherds found elsewhere within Area 1. A closer examination, however, indicates that while only three of the vessels recovered from the feature mend to sherds from other parts of Area 1, the same transfer print pattern (Indian Chief by Joseph Heath and Co.) occurs in both deposits in multiple colors (green and blue in Feature 120; green, blue and black from the plowzone and other features). Hence, an association is indicated between Feature 120 and the rest of Area 1 given this recurring transfer pattern and its proximity to the domestic structure.

Feature 120 was probably filled and capped between 1830 and 1845. This dating is based primarily on ceramic makers marks (see below) and the general absence of post-1840 material in the fill. Of 1,198 artifacts with ascribable introduction dates recovered from the feature, only three have introduction dates after 1830. These are three sherds of yellow ware and Rockingham. Since the introduction dates of these ware types are not firmly fixed, and given the small number of post-1840 introduction date objects recovered, it seems likely that this material was deposited and capped very early in the history of the occupation. This is further supported by the total absence of Prosser buttons from the deposition (see Appendix X). Prosser buttons were introduced in 1840 and rapidly become the most widely used button type (see Appendix X). An open channel of a relict creek would have provided a convenient location for the deposition of refuse from the domestic occupation. Pattern analysis (see below) suggests that the deposition approaches a purely domestic pattern which would be expected in a primary deposition. If the deposit represents only a decade of deposition while the domestic site was occupied for more than 50 years, it may not be surprising that so few mends exist between the deposit in Feature 120 and the rest of Area 1. Feature 120 provides an excellent sample of domestic debris of ironworkers from the Richard Green period of the Harford Furnace.

Archeological Investigations Outside of Area 1

Outside of Area 1, the headrace (Area 2) and a stone retaining wall (Area 3) were examined and recorded. A Trench was excavated across the headrace to examine its construction technique. The race had been excavated into the bank above the current alignment of Maryland Route 543 and the spoil was piled west (downslope) of the cut to produce an outer wall for the headrace (Figure 31, Layers D and E). After abandonment, the race appears to have silted in from slope wash (Layers A and C). No artifacts were recovered from the test trench.

In an attempt to understand the hydraulics of the headrace, elevations of the bottom of the race were shot every 5 m (16 ft). These elevations are all level within 30 cm (12 in). This suggests that very little fall in the race was occurring in the



a = very dark grayish brown (10YR3/2) silty clay loam (slope wash and organic accumulation)
b = dark brown (10YR3/3) silt loam (A horizon)
c = dark yellowish brown (10YR4/4) sandy loam with gray (10YR5/1) silty clay loam at bottom center, containing charcoal flecks throughout (wash layer)
d = brown to dark brown (7.5YR4/4) sandy clay loam (displaced subsoil)
e = dark yellowish brown (10YR4/4) sandy loam (displaced A horizon)
f = dark yellowish brown (10YR4/4) sandy loam (buried A horizon)
g = strong brown (7.5YR4/6) sandy loam mottled with 30% dark yellowish brown (10YR4/4) sandy loam (subsoil)
h = strong brown (7.5YR5/6) sandy clay loam (subsoil)
i = brown to dark brown (10YR4/3 silt loam mottled with 50% strong brown (7/5YR4/6) sandy loam, root disturbed (subsoil
= stones

FIGURE 31. Profile of headrace.

portion parallel to Maryland Route 543. It appears that water from James Run was diverted far upstream with the race cut into the terrace, diverting the water flow into a near level channel. Apparently, when James Run was dammed, this created a sufficient head of water to fill the race. It seems likely that an aqueduct carried the water across the road from the end of the race to the wheel, which would power the bellows to supply the blast for the furnace.

The retaining wall (Figure 32) was of dry laid, roughly dressed fieldstone. It extends parallel to the current Maryland Route 543. Large portions of the southern extreme seem to have eroded out leaving stone spread down the bank. The steps are also of roughly dressed fieldstone and are located at the northern end of the retaining wall. No temporally diagnostic artifacts were recovered from an exploratory cut near the top of the wall. The location of the retaining wall suggests that Maryland Route 543 follows a relatively old alignment. This is confirmed by historic maps (see Cartographic Research above).

The additional archeological tasks undertaken at Harford Furnace outside of Area 1 confirm that the feature defined by Parrington as Area 2 was the headrace for the blast furnace at the site. It appears that the bottom of the race was relatively level for the portion which parallels Maryland Route 543 and probably utilized an aerial flume to convey the water to the furnace location. The retaining wall (Area 3) appears most likely to have been in place by 1858 (see Jennings and Herrick map in Cartographic Research above), given the lack of change in alignment of Maryland Route 543. The steps in the extreme north would provide access to the company store.

Summary of Field Findings

The archeological fieldwork within the proposed impact area at the Harford Furnace site revealed a domestic complex composed of a two-celled, stone-footed frame structure with a formally-kept front yard area, and an enclosed back yard/service area delineated by fences. Both the back yard (north) and the front yard (south) contained numerous planting features, though no systematic pattern of plantings is apparent. The back yard fences are of different construction, suggesting that they are not contemporaneous. The north-south fence has posts spaced in such a manner to suggest a woven wire or barbed wire fence while the east-west fence posts occur at intervals suggestive of a plank fence with eight foot panels. Within the back yard a subrectangular privy was discovered which appears to have been in use until near the time of site abandonment. In the extreme northwest of the research area, two linear trenches that merge into one trench were discovered. They may have been spillways associated with the headrace which powered the blast for the iron furnace, or they may represent drainage features necessitated by the frequent inundation of the James Run floodplain. The slag concentration in the northern end of the site most likely represents the access road which appears on the Jennings and Herrick map of 1858. While appearing stratified, the deposition probably represents paving episodes.

Evidence of a filled relict creek bed was recovered at the extreme south end of the research area. This feature appears to have provided a convenient deposition location for debris. The feature appears to have been filled primarily before 1845. Given the early date and the nature of the deposition, it has been hypothesized that the creek bed had been filled early in the history of Harford Furnace, and may represent only a decade of primary deposition from the occupants of the house.

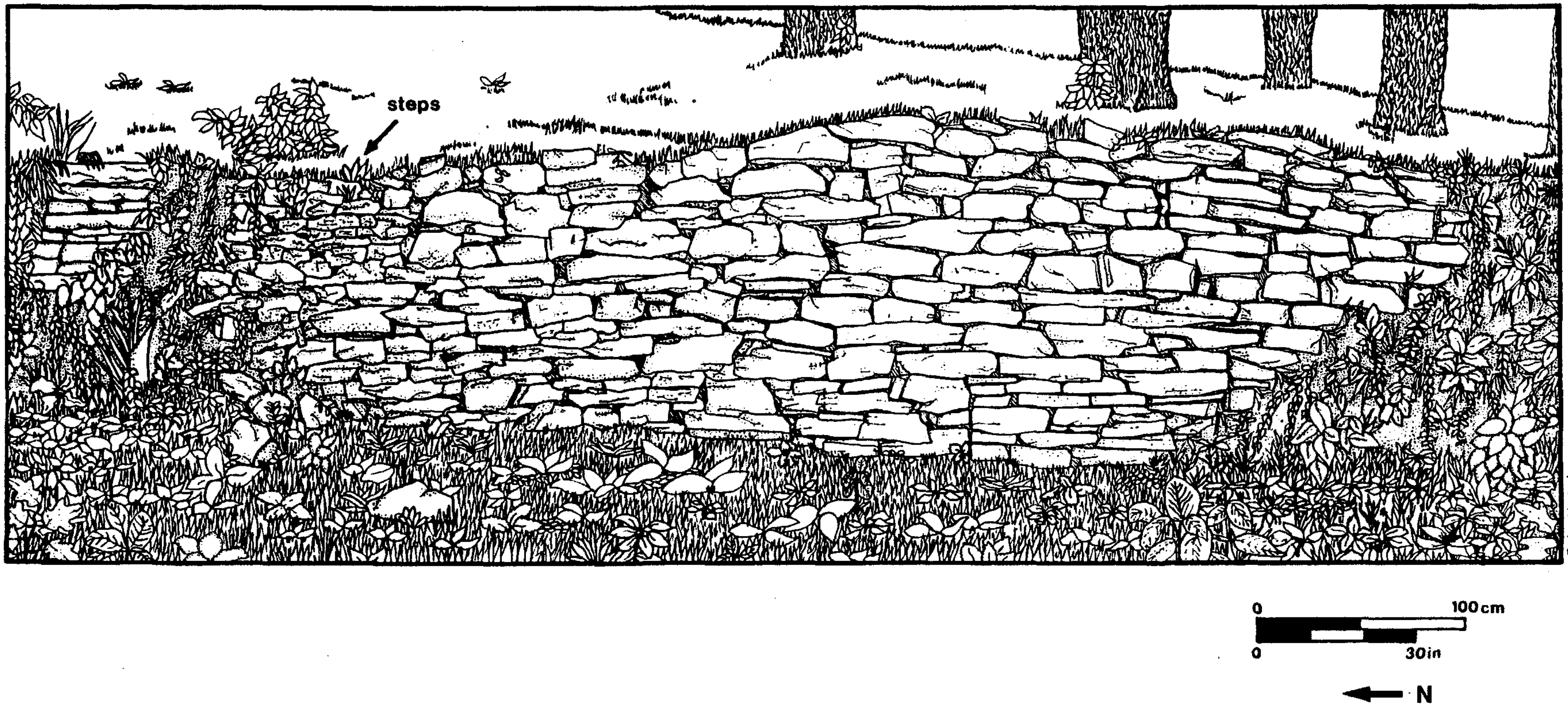


FIGURE 32. Stone retaining wall.

The random sampling of the research area which preceded the large, areal stripping, supports the contention that the area south of the domicile was a formally-kept "front" yard while the area north of the house was a service "back" yard. The greatest concentration of domestic debris occurred within the structure with lesser deposition in the back yard and fairly light deposition in the front yard. The random sample also revealed evidence of modern inundation with scouring and alluvial deposition in the extreme south of the research area that generally destroyed the archeological evidence of the 19th century occupation in this area. Finally, the random sample indicated the depositions of large quantities of slag in the extreme north of the research area. This highly compacted slag may have served as a road bed providing access to the principal industrial locus located to the west.

Summary of Architecture

The evidence of the domicile recovered archeologically at Harford Furnace suggests a two-celled center-chimneyed frame structure which was probably one-and-a-half or two stories. The building sat on a roughly dressed fieldstone foundation. The foundation for the chimney was of the same roughly dressed fieldstone. It is possible that three features south of the foundation (Features 61, 62, and 63) are evidence of the dressing of the fieldstone. Some brick was recovered in the excavations, so it is possible that the superstructure of the chimney was of brick. The evidence for the building being of frame construction is primarily the large number of nails recovered in proximity to the house. Very little plaster (less than 1 kg, 2 lbs) was recovered from the excavation. This, taken with the distribution of nail sizes (see Appendix IV), suggests that the building was not lathed and plastered on the interior. The recovered plaster could represent finish around the fireplace. It seems likely that the interior of the structure may have only been whitewashed. Such a finish would have been neither pretty nor insulative but functionally adequate.

The projected dimensions of the structure are 16 feet by 32 feet. Assuming a minimum of an upstairs loft, this would have provided 1,024 ft^2 of living space. If, as has been suggested, the structure was an industrial workers "duplex" this would have provided only roughly 500 ft^2 of living space per family. While this seems cramped by modern standards (given the average family size among married ironworkers of five) it should be noted that the typical tenant house size from 1780 to 1840 is roughly 16 feet by 16 feet (Marks 1979:51).

The picture that emerges from the architecture at Harford Furnace is of a relatively cramped living quarters, which were probably poorly insulated and hence relatively cold in the winter. Heat was provided by two hearths tied into a central chimney stack. While the fenestration of the structure cannot be hypothesized, the quantity of window glass recovered suggests that the building was well lighted by windows. In general, we have a very modest building. We must remember, however, that the occupants had little control over this portion of their living environment. As tenants, their housing was most likely provided by their employers, the Harford Furnace Company. It seems likely that they would have invested little of their personal capital in improving a structure which they did not own and of which they would not have known how long they would be residents. In all probability, the occupants of such a structure would have invested their funds in objects they could use while in residence and take with them when they left. Evidence to support this hypothesis is presented below.

THE ARTIFACTS

Introduction

For purposes of discussion of site chronology and function, the artifact collection obtained from the data recovery at Harford Furnace will be broken into three distinct study groups: the random sample of plowzone, the subsurface features associated with the domicile, and the artifacts recovered from the relict creek bed. The rationale for dividing the sample this way is based on the following assumption: the random sample is from plow-disturbed soils which may include post-occupational deposition; the subsurface features relate directly to the occupation of the domicile; and the relict creek bed material appears to be a primary, sealed deposit. The following sections will summarize the chronological attributes of each subset of data. For overall dating of the domicile's occupation, the random sample and the subsurface features will be combined.

Site Chronology

Mean Ceramic Date

Of the nearly 36,000 artifacts recovered in the excavations at Harford Furnace more than 14,300 were sherds. Our discussion of site chronology will begin with a calculation of the Mean Ceramic Dates (South 1977:210-230) for the various contents described above and then proceed through other chronologically sensitive aspects of the ceramic assemblage. These efforts will focus on the sherd level with a discussion at the vessel level to follow under the analysis of site occupation. The Mean Ceramic Date Formula is expressed as:

$$Y = \frac{\sum_{i=1}^{n} X_i \cdot f_i}{\sum_{i=1}^{n} f_i}$$

where:

X_i = the median date for the manufacture of each ceramic type
f_i = the frequency of each ceramic type
n = the number of ceramic types in the sample
Y = the Mean Ceramic Date

(South 1977:217)

The median date for the ceramic types were develped by South based on discussion with Ivor Nöel Hume. In our application of the Mean Ceramic Date formula we have augmented these dates with the dates of peak popularity for various decoration on whiteware as developed by Garrow (1982).

The mean dates for the occupation at Harford Furnace range from 1853 to 1856 (Table 12, Keys to Figures 33 through 35). The relict creek bed deposit provides a mean date of 1853 and the combined plowzone and subsurface feature samples yield a date of 1856. (The dates for the plowzone sample and the features

KEY TO FIGURE 33. Ceramic makers' marks - Plowzone.

Mark Number Type of mark	Manufacturer	Date	Godden reference
	(positive identifications)		
a. printed	J.W. Pankhurst and Co.	1850-1852	p.481
b. impressed	J.W. Pankhurst and Co.	1850-1882	p.481
c. impressed	James and Ralph Clews	1818-1834	p.152
d. impressed	Stubbs and Kent	1828-1830	p.601
e. printed	Turner, Goddard and Co.	1867-1874	p.625
f. printed	William and Thomas Adams	1866-1892	p. 23
g. printed & impressed	Joseph Heath & Co.	1828-1841	p.349
* printed	Job & John Jackson	1831-1835	p.318

* (identical to mark c from subsurface features - see illustration Figure 36)

Mark Number Type of mark	Manufacturer	Date	Godden reference
	(tentative identifications)		
h. impressed	Enoch Wood and Sons	1818-1846	p.686
i. impressed	James and Ralph Clews	1818-1834	p.152
	or Andrew Stevenson	1816-1830	p.596
	or		
	Adams	1810-1825	p.21
j. printed	Job & John Jackson	1831-1835	p.349
	or		
	John and George Alcock	1839-1846	p.27
	or		
	Jackson and Gosling	1866-present	p.350
	or		
	James and Charles Wileman	1864-1869	p.671
	or		
	Jones and Walley	1841-1843	p.360
	or		
	John and Robert Godwin	1834-1866	p.277
	or		
	James and Thomas Edwards	1839-1841	p.231

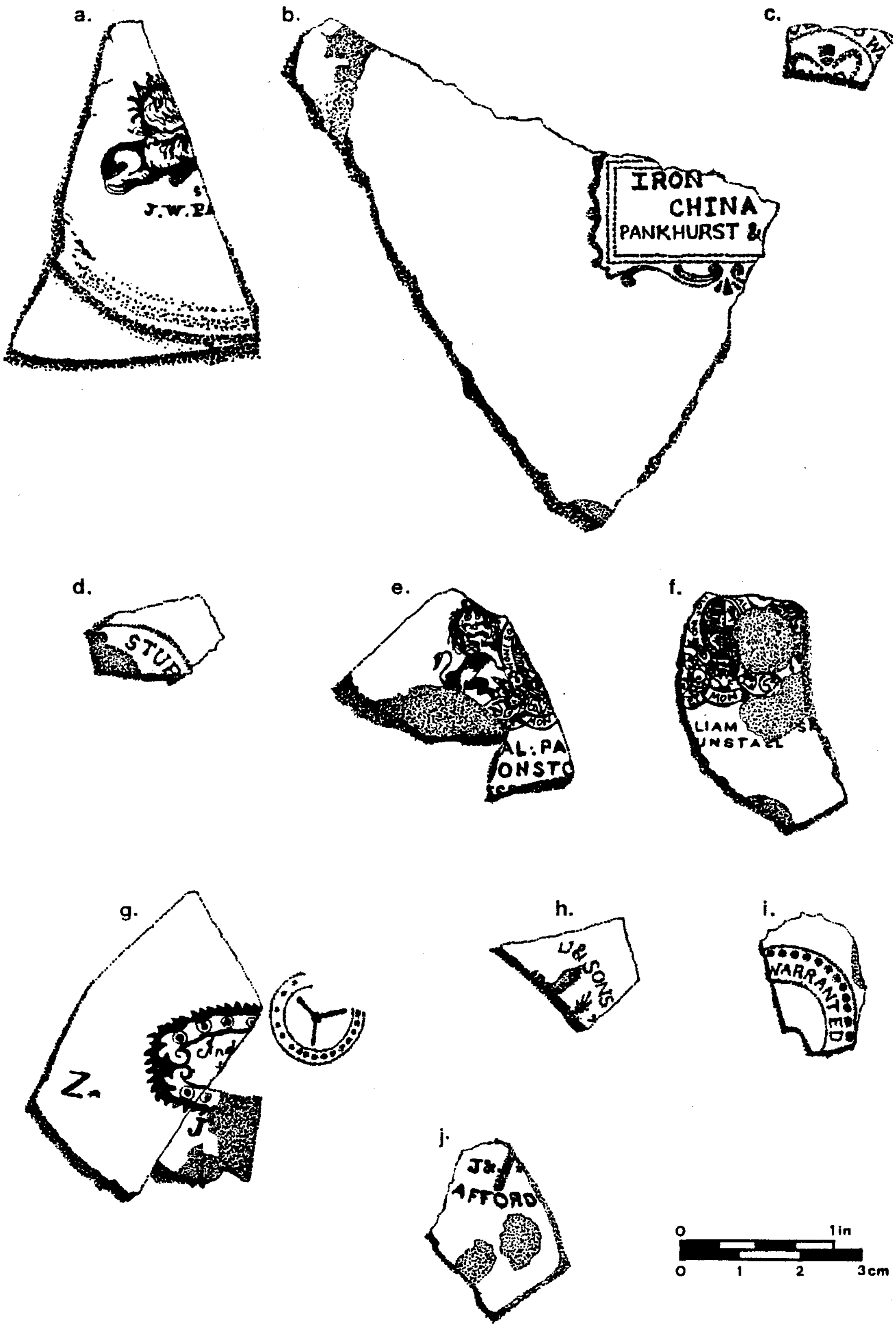


FIGURE 33. Ceramic makers' marks - Plowzone.

KEY TO FIGURE 34. Ceramic makers' marks -Relict creek bed.

Mark number Type of mark	Manufacturer	Dates	Godden Reference
	(positive identifications)		
a. impressed	William Adams and Sons	1800-1864	p. 21
b. impressed	William Ridgeway & Co.	1834-1854	p. 538
c. impressed	William Adams and Son	1800-1864	p. 21
d. impressed	William Ridgeway & Co.	1834-1854	p. 538 p. 538
printed	William Ridgeway, Son & Co.	1838-1848	p. 538 p.·538
*printed	Joseph Heath & Co.	1828-1841	p. 318
*impressed			

*(identical to mark g. from plowzone - see illustration Figure 33)

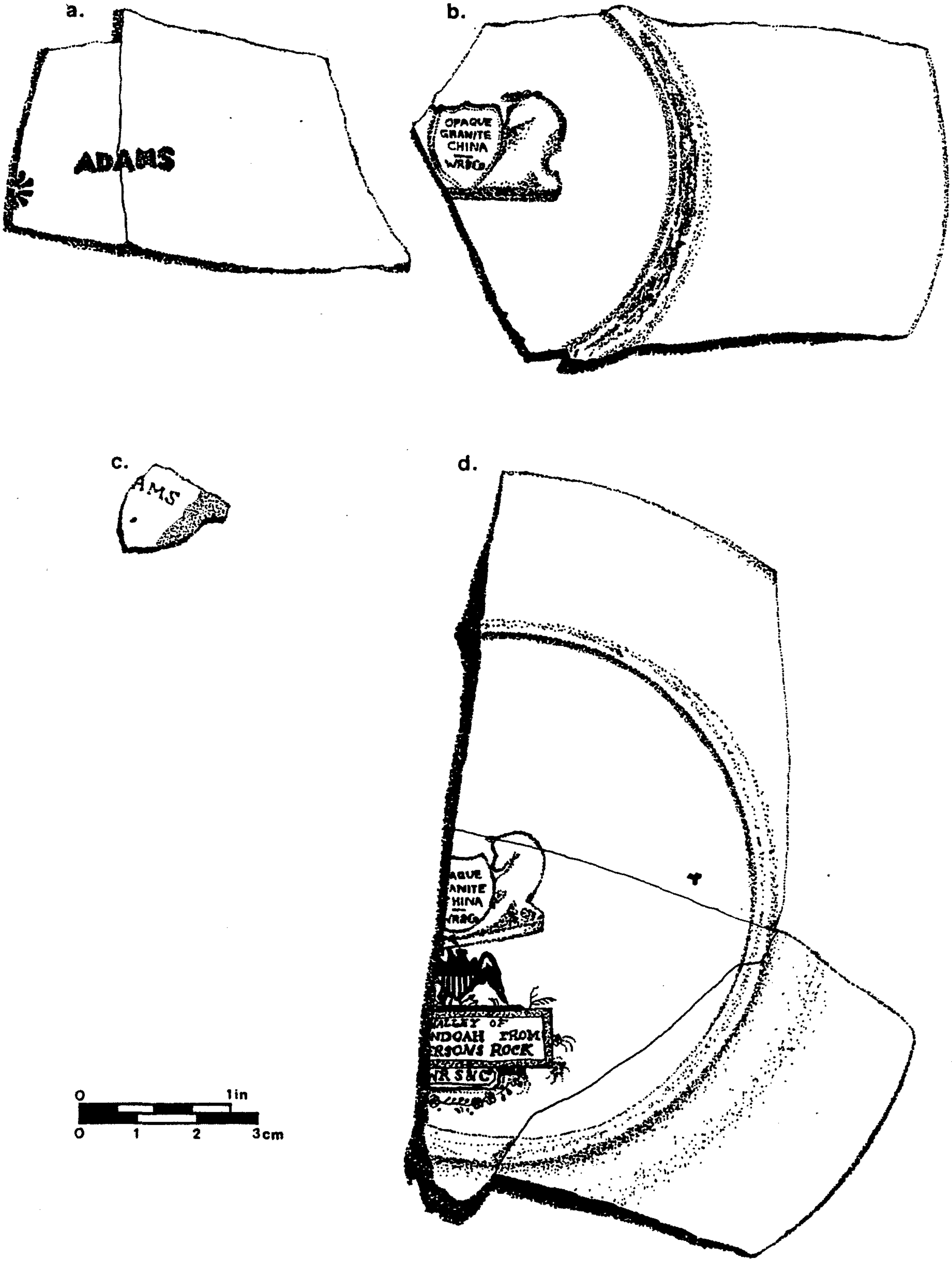


FIGURE 34. Ceramic makers' marks - Relict creek bed.

KEY TO FIGURE 35. Ceramic makers' marks - Subsurface features.

Mark number Type of mark	Manufacturer	Dates	Godden (1964) Reference
	(positive identification)		
a. impressed	James and Ralph Clews	1818-1834	p. 152
b. impressed	James and Ralph Clews	1818-1834	p. 152
c. printed	Job & John Jackson	1831-1835	p. 349
	(tentative identifications)		
d. printed	J. Jackson and Co. Holmes	1870-1887	p. 349
	or Jackson & Gosling (LTD)	1866-present	p. 350
	or James & Charles Wileman	1864-1869	p. 671
	or John and George Alcock	1839-1846	p. 27
e. printed	Enoch Wood and Sons	1818-1846	p. 686

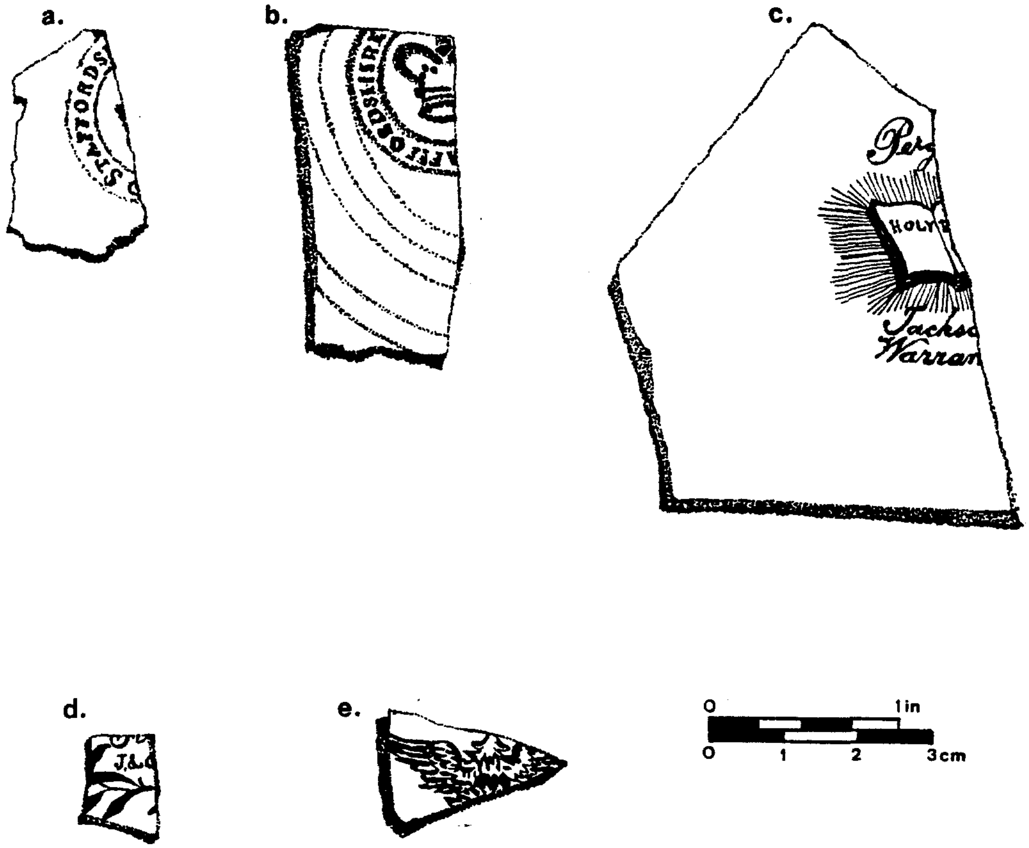


FIGURE 35. Ceramic makers' marks - Subsurface features.

TABLE 12. Distribution of makers' marks within the site.

	plowzone	relict creek	domestic features
positive ID	10	4	5
tenative ID	3	1	1
unidentified	13	2	3
total:	26	7	9

by themselves were 1856 and 1854 respectively). The overwhelming number of plain whiteware sherds (51% to 63% of each sample) and the wide date brackets associated with this ceramic type may push the calculated Mean Ceramic Dates forward in time. As a check on this potential source of bias, the Mean Ceramic Dates were recalculated excluding plain whiteware. The results indicate dates nearly a decade earlier. The relict creek sample gives us a date of 1846 while the plow zone sample and the features both date to 1849. All of these dates fit fairly well within the known historic dates for the occupation, but tend to provide a rather static date that does not necessarily reflect the range of time the site was occupied. Specifically, the relict creek bed date of 1853 is late due to the abundance of plain whiteware although other dating criteria indicate 1830-1840 filling. Even with the plain whiteware excluded, the 1846 date is late for the mean of deposit. The lack of bracket dates for various decorations of whiteware precludes application of South's bracket dating system as 93% of the sample would have been lumped under the bracket date for whiteware (1820 through 1900+). Therefore although the Mean Ceramic Date Formula provides us with a measure of site date which is comparable with those provided by other researchers, the dates provided by the makers' marks analysis are of greater utility (see below).

Ceramic Makers' Marks

A total of 42 ceramic back marks were recovered in the course of the excavations at Harford Furnace. Of these only 19 (43%) are positively identifiable and an additional five (12%) are tenatively identifiable. Most of the identifiable marks are from the plowzone with the remainder from the relict creek bed and other features (Table 12).

The marks from the plowzone indicate a general bracket of 1800 to ca. 1890 with the most recent date for the introduction of a mark being 1867 (Figure 33, see Godden 1964). These dates fit reasonably well within the historically known dates of occupation for the site.

The marks recovered from the relict creek deposit (Figure 34) have a somewhat more circumscribed date range than those recovered from the plowzone. Based on the Ridgeway mark, the deposition must have occurred after 1834, but given the Heath mark, not long after 1841. This again supports the contention that the feature was filled between 1830 and 1845 as suggested by the absence of Prosser buttons (see Appendix X).

The final group of bottom marks to be considered are those recovered from the features related to the domestic structure in Area 1 (Figure 35). These marks generally cluster in the first four decades of the 19th century (see Godden 1964). The exception is mark number 35D which dates to the period 1870 - 1887.This mark was recovered from the privy, which is in keeping with the relatively late date ascribed to this feature based on the whole bottle recovered near the bottom. This supports the contention that the privy was filled relatively late in the site's life.

In general, the bottom marks recovered from the excavations at Harford Furnace suggest an occupation spanning the 19th century. The marks primarily cluster in the period 1830 to 1870, which fits reasonably well with the known occupation dates of the site. The marks all represent English manufacturers, generally from the Staffordshire region. This is in keeping with other sites of the time period, as England dominated the ceramic trade in the 19th century not only in the United States but all over the world.

Transfer Print Patterns

Additional chronological information can be obtained from ceramics by identifying specific transfer print patterns recovered in the excavations at Harford Furnace. Some of these patterns had relatively short periods of popularity. In addition to specific, identifiable patterns, some chronological information can be gleaned from the style of the print under consideration. Both of these lines of reasoning will be addressed below.

Nine vessels printed with the "Indian Chief" pattern by Joseph Heath and Company were recovered in the excavations at Harford Furnace. This is a "Romantic" pattern in that the "Indian Chief" is pictured with onion domed buildings in the background (cf. Figure 36). Williams (1978:503) dates this pattern to the 1828 to 1841 period. The Harford examples are printed in blue, green, and black. Vessels were recovered from both the general site area and from the relict creek.

Two vessels transfer printed in blue with the pattern "Pergamos" of the "Holy Bible" series by Job and John Jackson were recovered from Harford Furnace (cf. Figure 37). Pergamos was an ancient city in Asia Minor famed for its library in the late Alexandrian period (Young 1974:745). While no reference to this specific pattern has been found in the literature, Little (1969:74) states the company produced "English rural scenes and a few scriptural design." The company was in business from 1831 to 1835 (Coysh and Henrywood 1982:197). Both vessels were recovered within the house foundation; one was from what has been interpreted as a stair support. This provides a relatively close construction date for the house.

One vessel with a black transfer print pattern of "Valley of the Shenandoah from Jefferson's Rock" by William Ridgeway and Sons was recovered from the relict creek bed (Figure 38). The pattern was based on a drawing by W.H. Burtlett which was subsequently engraved by J.T. Willmore in 1839 (Larsen 1939:108). The vessel bears the impressed mark of William Ridgeway and Company (1834-1854) and the printed mark of William Ridgeway Sons, and Company (1838-1848) (Godden 1964:538). Given the date of the engraving and the presence of the William Ridgeway and Sons mark, the specimen must date between 1839 and 1848.

One vessel transfer printed in sepia with a simple blue banded border was recovered from the plow disturbed soils at Harford Furnace (Figure 39). The pattern consists of three sepia-printed ceramic vessels in the center of a plate

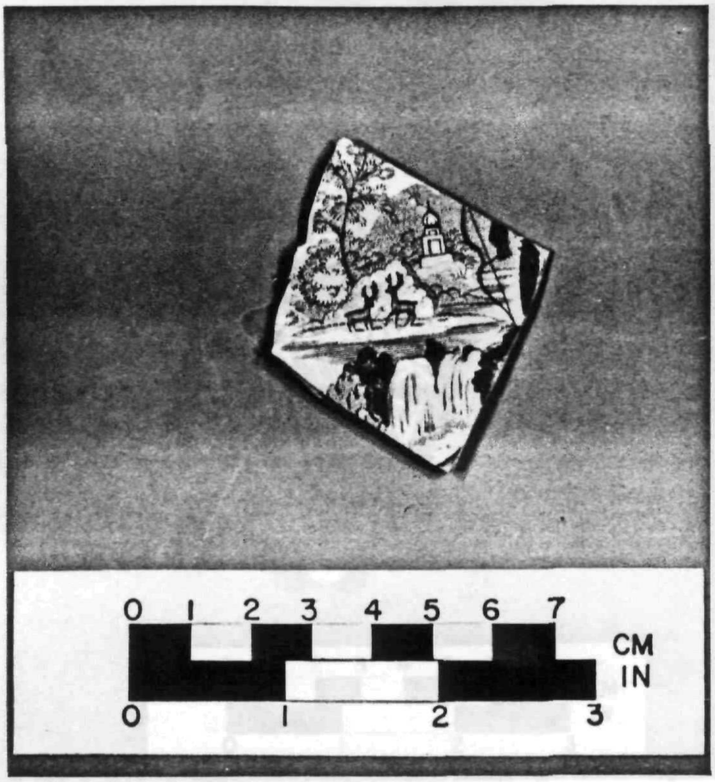


FIGURE 36. **Transfer print pattern - Indian Chief.**

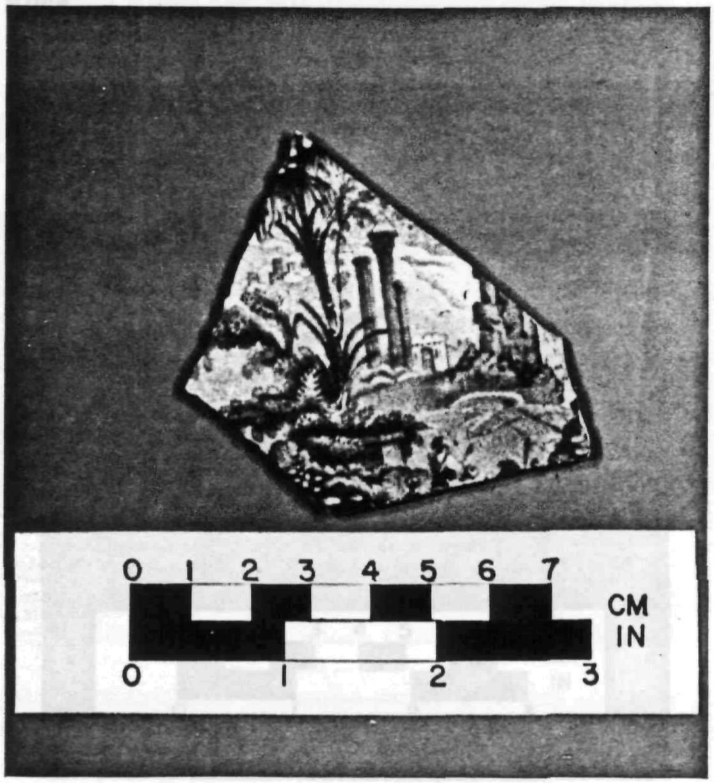


FIGURE 37. **Transfer print pattern - Pergamos.**

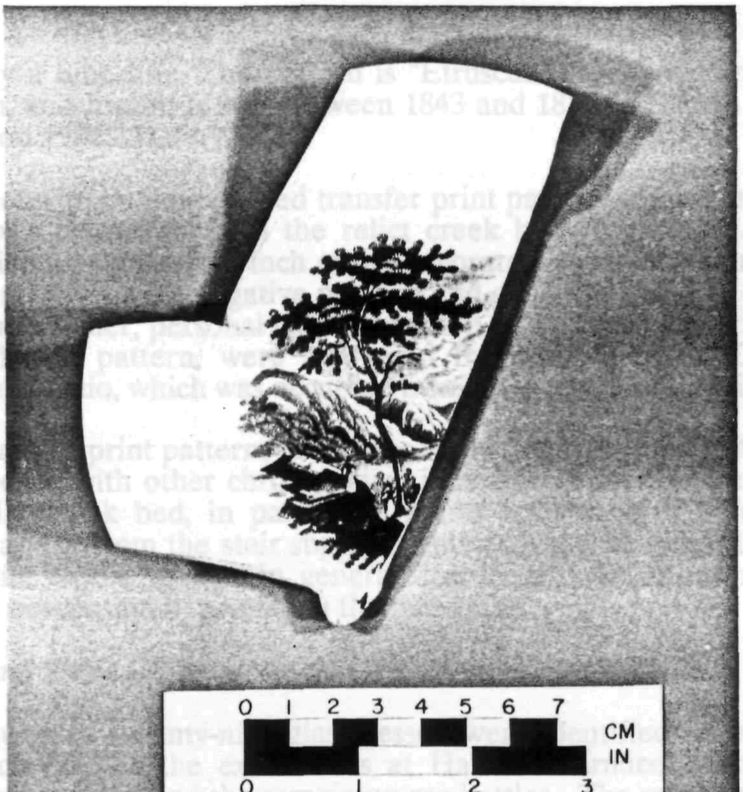


FIGURE 38. Transfer print pattern - Valley of the Shenandoah from Jefferson's Rock.

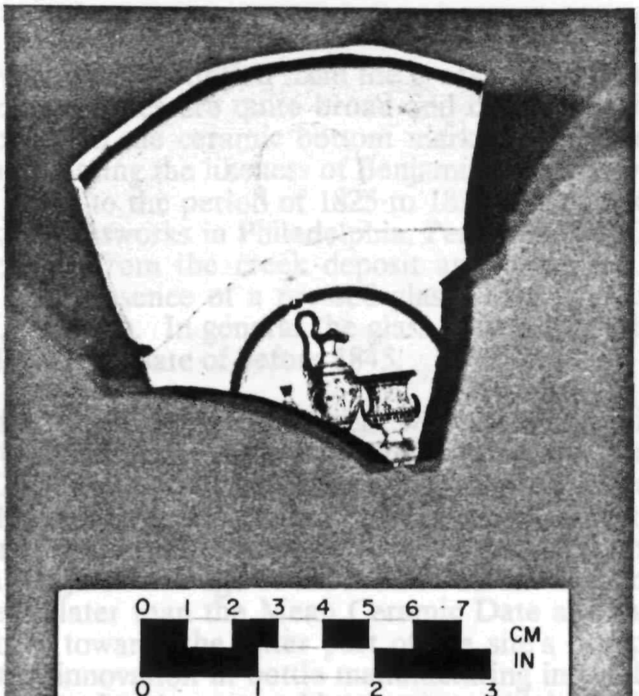


FIGURE 39. Transfer print pattern - Etruscan Vases.

surrounded by a blue line. The pattern is "Etruscan Vases" and was produced by Thomas, John, and Joseph Mayer between 1843 and 1855 (Williams 1978:68; Coysh and Henrywood 1982:131).

A vessel with an unidentified transfer print pattern of an intensely dark blue floral motif was recovered from the relict creek bed (Figure 40). This style of transfer printing in which every inch of the decorated surface is saturated with color is sometimes referred to as negative printing and generally dates to the period 1820 to 1840 (George Miller, personal communication 1987). Similarly printed vessels, in a slightly different pattern, were recovered from the Franklin Glass Works in Portage County, Ohio, which was occupied from 1824 to 1832 (G. Miller 1986:61).

The transfer print patterns and styles recovered from Harford Furnace are in basic concurrence with other chronological indicators from the site. The material from the relict creek bed, in particular, points to a date of before 1845. The "Pergamos" pattern from the stair support reinforces the dating of the construction of the domicile to the 1830s. In general, the identifiable transfer print patterns support a site occupation beginning in the mid-1830s.

Bottle Glass and Table Glass

Two hundred seventy-nine glass vessels were identified from the 2,678 glass fragments recovered in the excavations at Harford Furnace. Sixty-one of these vessels were table glass, and the remaining are bottles. The results of the minimum vessel estimate are presented in Appendix V. Functional considerations are discussed and summarized later in this report with the focus here on chronology. Again, the creek deposit and the rest of the assemblage will be segregated for this discussion.

Twelve bottles were identified from the creek deposit. In general, the dates for these fragmentary bottles are quite broad and do not provide as constricted a temporal indicator as do the ceramic bottom marks. The exception to this is an amber colored flask bearing the likeness of Benjamin Franklin which McKearin and Wilson (1978:455) date to the period of 1825 to 1837. The flask was manufactured by the Kennsington Glassworks in Philadelphia, Pennsylvania. Only five table glass vessels were identified from the creek deposit and these too have rather broad temporal limits. The presence of a pressed glass vessel suggests deposition after 1827 (Jones et al. 1985:34). In general the glass vessels from the creek deposit do not contradict a deposition date of before 1845.

Two hundred sixty-two glass vessels were identified in the rest of the assemblage. Fifty-six of these were table glass while the remaining 206 were bottles. Of the 206 bottles, 140 had reasonably ascribable bracket dates. In an attempt to date the general occupation of the site, these bracket dates were used to create median dates for the bottles. A mean date of 1868 for the 140 vessels was calculated from a weighted average of the median dates. This mean date of 1868 is roughly twelve years later than the Mean Ceramic Date and may reflect a greater deposition of bottles towards the latter part of the site's occupation. This may in turn be the result of innovation in bottle manufacturing in the last half of the 19th century which made bottles cheaper and hence more widely used.

The table glass from the non-creek contexts generally supports the occupation dates provided by other temporal indicators. Specimens date from the

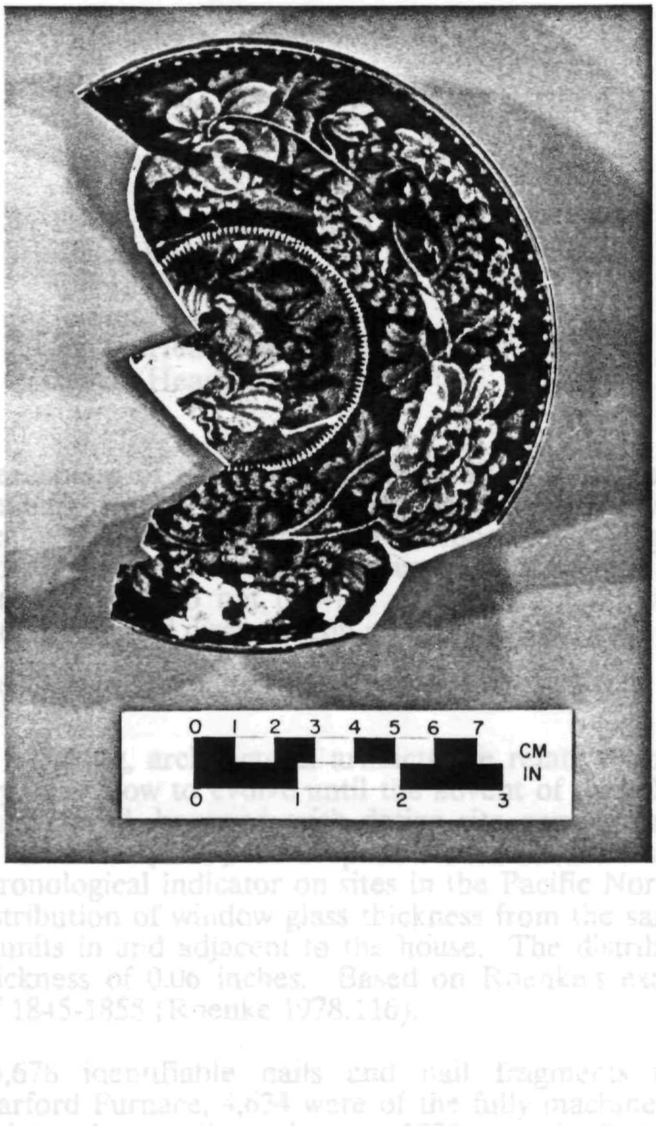


FIGURE 40. Transfer print pattern - Dark Blue Floral Motif.

second quarter of the 19th century to the end of that century. In general, the table glass provides little clarification to our dating of the site occupation.

The bottle and table glass recovered from the excavations at the Harford Furnace site suggest occupation extending from the second quarter of the 19th century to the early 20th century. The material recovered from the creek deposit tends to support the previously forwarded date of 1830 to 1845. The occurrence of some fully machine-made bottles at the site may reflect post-occupational deposition, as all of these were recovered from plowzone.

Numismatic Items

Seven coins were recovered from the excavations at Harford Furnace. All were from plow disturbed soils and all were pennies (Table 13).

TABLE 13. Coins from Harford Furnace.

Number	Type of Coin	Date
1	Large cent; Liberty Cap type	1795
2	Flying Eagle cent	1857
1	Indian Head cent	1860
1	Indian Head cent	1863
1	Indian Head cent	1882
1	Indian Head cent	1885

With the exception of the 1795 large cent, all of the coins cluster from the mid-1850s to the mid-1880s. The 1795 specimen is extremely worn, suggesting considerable circulation and curation before deposition. In general, the coins recovered date to the last half of the site occupation. Since the loss of coins is an infrequent occurrence, they do not provide as significant a dating tool as other artifacts which are broken and discarded on a regular basis.

Architectural Artifacts

Generally speaking, architectural artifacts are relatively poor chronological indicators, as they were slow to evolve until the advent of the 20th century. Some success has been achieved, however, with dating site occupation through window glass thickness. Roenke (1978) developed a method for using window glass thickness as a chronological indicator on sites in the Pacific Northwest. Figure 41 illustrates the distribution of window glass thickness from the sample recovered in the random test units in and adjacent to the house. The distribution is unimodal with a modal thickness of 0.06 inches. Based on Roenke's examples this would indicate a date of 1845-1855 (Roenke 1978:116).

Of the 4,678 identifiable nails and nail fragments recovered in the excavations at Harford Furnace, 4,634 were of the fully machine-made cut variety. Nelson (1968:6) dates these nails to the post-1820 period. Only 15 wrought nails were found in the excavation. These nails could have served special functions, as Nelson has pointed out that wrought nails continued to be used after the introduction of the machine cut variety (Nelson 1968:6). Only 29 wire nails were

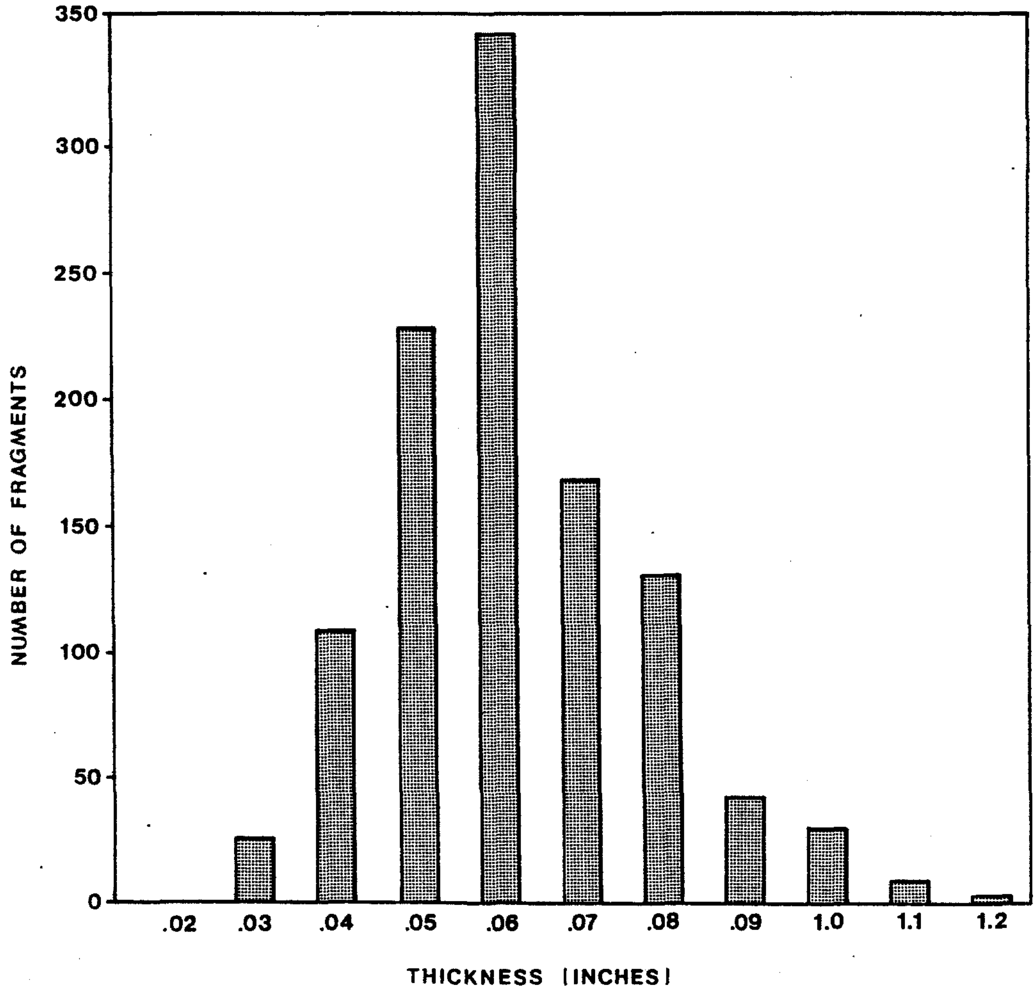


FIGURE 41. Window glass thickness distribution.

recovered in the excavation. These would date to the period of post-1870 (Nelson 1968:6). Given the extreme preponderance of cut nails and the paucity of wrought or wire nails, general bracket dates of 1820 to 1870 can be suggested. This is in basic concurrence with other temporal indicators and the historic record.

In general, the architectural material recovered at Harford Furnace points to an occupation after 1820, with site abandonment shortly after 1870. This essentially agrees with the other dating tools discussed earlier. Additionally, these dates fit within the historically known period of when Harford Furnace was in existence.

Clothing Artifacts

Artifacts from the clothing group, specifically buttons, provide some temporal data on the occupation of Harford Furnace. In both the random sample and the features associated with the domicile, large numbers of Prosser buttons were recovered. These buttons date to the post-1840 period (see Appendix X). The relict creek bed deposit was totally lacking in Prosser buttons which strongly suggests a deposition date before Prosser buttons became widespread. Additionally, a cast pewter button with a backmark dating 1806 to 1830 was recovered from this deposit (see Appendix X). Generally speaking, the overall collection of buttons from the excavations dates to most of the 19th century and therefore does not provide a more sensitive time marker than the other classes of artifacts discussed herein.

The remains of a number of leather shoes were recovered from the relict creek bed deposit. The information, descriptions, and illustration of these are included in Appendix VI, but the chronological implications are summarized here. Based on manufacturing technique, the shoes suggest a date at the end of the first quarter and the beginning of the second quarter of the 19th century. This is a bit earlier than the other artifacts suggest for the creek deposit, but is within the realm of possibilities assuming relatively conservative, old-time shoemakers or shoes that had been curated for some time before deposition. It should be noted that all the shoes were extremely worn and that some had had leather from them recycled. This would support the contention of possible curation. None of the shoes showed burning or other damage which one would expect from shoes worn by ironworkers. This may suggest that the shoes were deposited during the construction phase of the furnace rather than while it was in operation. If the latter is the case, this may serve as an explanation for the relatively early dates expressed by the sample.

Very fragmentary shoe remains were recovered from the upper levels of the slag-paved road in the extreme north of Area 1. These remains had eyelets of the type characteristic of the latter part of the third quarter of the 19th century. Since these are from the upper levels of the slag road, they indicate the road was in use at that time rather than suggesting a construction date for the road.

Tobacco Pipes

Numerous clay tobacco pipes were uncovered in the course of excavation at the Harford Furnace site. Information on these is provided in Appendix VII and summarized here. Two pipe fragments in the collection are marked "Peter Dorni" (Table 14). Dorni pipes appear to date from at least 1850 until the early 1900s (Omwake 1961; Duco 1986). Three stems bearing the mark "J & C PRINCE" and "INGOUDA" relate to a Dutch company in business from 1773 to 1898 (Oswald 1975:118). A specimen marked "MURRAY" and "GLASGOW" probably was manufactured by William Murray and Company, who were in operation from 1830 to 1861 (Oswald 1975:205). Two other Scottish stems bore the mark "McDOUGALL" and "GLASGOW" and probably relate to Duncan McDougall and Company who were in business from 1847 to 1868 (Oswald 1975:205). A very fragmentary bowl bearing the legend "HOME" is probably an example of the "Home Rule" pipes manufactured to popularize the Irish Home Rule Movement. The Irish Home Rule Movement dates from approximately 1870 to 1916 (Alexander 1986). The remaining decorated pipe fragments have very poorly defined time periods.

TABLE 14. Tobacco pipe maker's marks.

Manufacturer or Mark	Number of specimens	Date	Context
"Peter Dorni"	2	ca. 1850-ca. 1900	plowzone
"J & C Prince"	3	1793 -1898	plowzone
"Murray"	1	1830 -1861	plowzone
"McDougall"	2	1847 1868	plowzone
"Home Rule"	1	1870 ?	plowzone

In general, the marked tobacco pipes recovered at Harford Furnace point to an occupation spanning the 19th century. The Murray and McDougall specimens, given their more constricted time frame, provide perhaps a better indication of site occupation. No attempt was made to utilize bore dating techniques such as Harrington's (1978) or Binford's (1978), as Walker (1978) has aptly demonstrated its non-applicability to 19th century samples.

Chronology in Summary

In general, the chronologically sensitive artifacts recovered from Harford Furnace are in basic agreement with the historically documented occupation of the site. The ceramic makers' marks, the bottle and table glass, the architectural artifacts, the clothing items, and the tobacco pipes all point to an occupation beginning in the second quarter of the 19th century and extending to the end of that century. The mean ceramic date (1856), the mean bottle date (1868), and the modal date for window glass (1845-1855) all fall within a two-decade period. This close correlation of varying dating tools strongly suggests a well defined occupation ranging from the early 1830s to the 1880s.

The material from the relict creek bed documents an even more constricted time period. The absence of later ceramic types or other domestic debris points to a filling date of between 1830 and 1845. In all likelihood, the relict creek bed was filled in one decade beginning after 1834 when the property was purchased by the furnace company and was capped and sealed with slag by around 1845. As such, the deposit probably represents the refuse of only two families living in the industrial duplex during the Richard Green period of the Harford Furnace site.

Analysis of Site Occupation

Architectural Analysis

As noted in the summary of architecture (above) the structure uncovered in excavations at Harford Furnace was a two-celled, center-chimneyed, frame constructed "duplex." The building (assuming at least a loft) provided approximately 1,024 square feet of living space for two families which would have averaged five members each or approximately 100 square feet per individual. The building does not appear to have been plastered on the inside and heat was provided by two hearths attached to the "H"-shaped central chimney. All in all we have a quite modest house.

To put this building in perspective, it is necessary to compare it with other industrial workers' houses. Heberling (1987) has proposed an analytical technique to do just this based on his work at Greenwood Furnace in Pennsylvania. Heberling ranked domestic structures at the associated industrial village based on the means of the values derived from available space, sophistication of the foundation, number of stories, and type of heating (Table 15).

Applying these criteria to our structure we have a rank of 1.87. It should be noted that this value may be somewhat understated as it is possible that stoves were tied into the flues at our structure, but did not leave an archeological record, and we do not know if coal was used as a fuel source. Heberling (1987) also notes that the presence or absence of a cellar can be affected by environmental constraints such as a high water table or potential for floods as is the case at Harford Furnace.

In comparing our architectual ranking to Heberling's examples we find our structure is average. His architectural rankings, derived for entire neighborhoods, range from 1.37 to 2.87. It is not known if any of Heberling's examples are duplexes or if they were all single family dwellings. Two of his neighborhoods ranked higher while three ranked lower than the Harford Furnace example. Ideally, a survey of other domestic sites at Harford Furnace should be undertaken to place our structure in perspective in its own community.

Floral Analysis

The most significant finding of the floral analysis (Appendix VIII) is that the recovered data did not conform to an expected pattern for a rural domestic site. Rural domestic sites are generally characterized by self-sufficiency in food production, and archeological floral assemblages generally reflect a commitment to agriculture through the recovery of grain seeds, vegetable seeds, and fruit seeds. The floral assemblage does not suggest a major commitment to agricultural pursuits. Rather, the data suggest that the site occupants' energies were being directed to their cash-producing occupations, i.e., ironworking, rather than production of directly consumable foodstuffs.

The only indication of a grain crop recovered from the site area was two millet seeds. Millet is highly tolerant of poor drainage conditions and an otherwise adverse growing environment. In the realm of fruits and vegetables, only two curcurbit seeds were recovered. Mustard, pepper grass, and dock seeds were also identified, which could have provided green leafy vegetables that were a good source of vitamin C. All of these vegetables are low maintenance crops requiring

TABLE 15. Architectural scaling.

(Heberling 1987)

		Value
	1. Foundation Plan	
a.	less than 280 square feet	1.00
b.	281-350 square feet	1.50
c.	351-500 square feet	2.00 *
d.	501 plus 500 square feet	2.50
e.	E11 or addition	+.50
	2. Foundation Type	
a.	none	1.00
b.	piers	1.25
c.	dry wall on surface	1.50
d.	dry wall in trench	2.00 *
e.	mortared wall	2.50
	3. Elevation	
a.	1 story	1.00
b.	1-1/2 stories	1.50
c.	2 stories or more	2.50 *
	4. Heating plant	
a.	fireplace only	1.00 *
b.	stove, one flue	1.50
c.	stoves, two or more flues	2.00
d.	soft coal; hard coal	+.25, +.50
	5. Cellar	
a.	partial	1.50
b.	full	2.00

(* Harford Furnace domicile)

few man hours of labor with maximum return for effort. Wild and domestic fruit sources - cherry, peach, and blackberry seeds - were also recovered. The blackberry could reflect utilizing available food sources from the environment, which require only the harvesting and not the prolonged process of planting and nurturing characteristic of domestic plants. The low recovery rate of peach coupled with the fact that peach trees are not likely to survive, given the drainge conditions at the site area, suggest that the peaches were purchased and brought to the site.

A general absence of ornamental flowers suggests both a transient population and a lack of adornment that one would expect in a home occupied by families. Given census data that suggests that single men lived elsewhere in a barrack-type of housing and an abundance of artifacts recovered which suggest a family occupation, i.e., children's toys, sewing equipment, and numerous buttons, this is somewhat surprising. However, it seems possible that transient families planning to obtain their own property may have postponed the planting of ornamentals. The planting of ornamentals infers both an emotional and physical investment in the land that transients would be unlikely to do. It should be noted, however, that numerous planting features were uncovered by the excavations. Perhaps these represented perennial which could be moved by site occupations when their tenure at the site expired.

The absence of medicinal herbs is understandable when viewed with the large number of patent medicine bottles recovered in the excavations (see below). This certainly suggests that needed medicinal compounds were purchased rather than derived from homegrown herbs.

The floral analysis of the material recovered from Harford Furnace suggests occupants derived little of their food, medicine, or aesthetic satisfaction directly from the land. The absence of expected crops and vegetables points to a reliance on purchased goods rather than direct production. This is in keeping with site occupants who, in the broadest sense, had more money than time. This would lead to a procurement strategy of purchase rather than production.

Faunal Analysis

A detailed analysis of the faunal material recovered from the excavations at Harford Furnace is contained in Appendix IX. Relevant information from this study and comparison with other assemblages recovered elsewhere will be presented below.

The bulk of the faunal remains from the Harford Furnace excavations are mammal bones. Of identifiable mammal bones, pig constitutes 50%, while cow is only 10%. All other mammals (with the exception of house cats and rats) make up less than 5%. Of commonly consumed mammal species (cows, pigs, sheep, goats, and game animals), pig constitutes nearly 80% of the sample. Wild game makes up less than 4% of this same group. Preferred pork cuts appear to be primarily ham and shoulder portions. The presence of some symmetrically sawn pork bones suggest ham steak type cuts. Cow had considerably more symmetrically sawn bone which would represent specialty type cuts such as shank and round steak. Additionally, some of the cow bone was cut in such a way as to suggest standard bulk cuts such as round/rump and hind-shank roasts. Both pig and cow bones included extremities and cranial elements generally discarded during the initial butchering. This suggests that butchering was actually being carried out on-site.

Maturation data suggests a general selection of pigs under a year old for slaughter while cows tended to be somewhat older.

In addition to the mammals, fish and fowl also provided food for the table. The predominate avian species was chicken; some turkey was also eaten. Among the fish, we have both yellow perch and catfish. Of the two, yellow perch was the overwhelming choice. Both of the fish species should occur in the lower reaches of James Run and may indicate a combination of recreation and food procurement.

The most unusual faunal remain recovered in the course of excavations at Harford Furnace was a bobcat humerus. Bobcat is relatively rare in historic, domestic faunal assemblages from the eastern United States. It is perhaps evidence of predator elimination. Other non-food species included horse or mule, rat, house cat, chipmunk, and mole. Historical data suggest that mules were used extensively at the furnace as the principal draft animal. House cat remains included most of one individual recovered in the plow zone, which probably represents a pet burial. It is possible that the mole and chipmunk were later, intrusive additions to the assemblage.

To place the Harford assemblage in context, the collection was compared with nine other assemblages from historic sites. The comparison was based on the relative frequency of cow, pig, sheep/goat, domestic bird and fish bones within each collection (Table 16). The collections used were: The Rising Sun Tavern (Thompson 1987), the Bray well (Barber 1976), three samples from Oxon Hill (Garrow and Wheaton 1986), the Grant Tenancy (Taylor et al. 1987), the Hamlin site (Morin 1986) Phoenix (Henry 1987b), and Popes Freehold (Henry Miller, Personal Communication 1988). To efficiently compare these assembledges the Brainerd-Robinson method of seriation was utilized.

The Brainerd-Robinson technique was proposed in order to deal with the problem of lack of objectivity in bar-graph seriation (Brainerd 1951; Robinson 1951). Brainerd and Robinson developed a method of quantifying the degree of similarity between every two assemblages in the seriation. To do this they introduced a "coefficient of similarity" which is calculated for each pair of units by (1) finding the differences in the percentages of all the types (using absolute values), and (2) subtracting the sum from 200 (which would be "maximum disagreement") in order to obtain the coefficient of agreement. Thus, high coefficients reflect a high degree of similarity (range = 0-200). Once all of these coefficients are obtained, the assemblages are arranged in a matrix so that the coefficients are highest near the diagonal running from top left to bottom right, and decrease ideally in an orderly manner in both directions away from the center.

To assist in arranging the values properly in the matrix, the Renfrew-Sterud close proximity method was applied (Renfrew and Sterud 1969). This method is necessary when the data are non-linear but involves some clustering. It creates a precedence for arrangement within the matrix.

The Harford Furnace faunal assemblage shows the greatest amount of similarity with the Popes Freehold collection (Table 17). The Popes Freehold assemblage results from a tenant farmer occupation of roughly the same time period as the Harford Furnace assemblage. Hence, the diet of the industrial tenants at Harford Furnace does not appear to be greatly different from the diet of agrarian tenants.

TABLE 16. Faunal data comparisons.

	A		B		C		D		E		F		G		H		I		J	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
COW	97	27.17	282	20.33	221	55.11	203	23.36	182	61.49	162	33.47	508	53.47	2142	64.60	50	15.92	70	14.06
PIG	72	20.17	391	28.19	79	19.70	302	34.75	101	34.12	133	27.48	113	11.89	180	5.43	118	37.58	297	59.64
SHEEP AND GOAT	29	8.12	298	21.49	73	18.20	189	21.75	13	4.39	69	14.26	2	0.21	488	14.72	7	2.23	19	3.82
DOMESTIC BIRDS	111	31.09	246	17.74	0	0.00	107	12.31	0	0.00	71	14.67	261	27.47	481	14.51	46	14.65	64	12.85
FISH	48	13.45	170	12.26	28	6.98	68	7.83	0	0.00	49	10.12	66	6.95	25	0.75	93	29.62	48	9.64
TOTAL	357	100.00	1387	100.00	401	100.00	869	100.00	296	100.00	484	100.00	950	100.00	3316	100.00	314	100.00	498	100.00

A: RISEING SON TAVERN 1725-1830	B: BRAY WELL 1770-1790	C: OXON HILL WELL (LOWER) MID 18TH C.	D: OXON HILL WELL (UPPER) MIXED 18TH & 19TH C.	E: OXON HILL MEATHOUSE 1740-1780
F: GRANT TENANCY 1790-1830	G: HAMLIN SITE 1780-1856	H: PHOENIX 1880-1930	I: POPES FREEHOLD 1830-1860	J: HARFORD FURNACE 1830-1880

TABLE 17. Brainerd-Robinson Index of Agreement: faunal analysis.

	E	C	H	G	A	F	B	D	J	I
E	200.00	158.41	142.61	131.16	103.46	130.68	105.83	123.75	103.99	104.57
C	158.41	200.00	152.02	145.05	123.95	148.82	130.44	136.50	89.11	89.70
H	142.61	152.02	200.00	148.74	111.96	136.83	111.47	113.14	73.81	77.71
G	131.16	145.05	148.74	200.00	147.39	134.39	114.24	109.45	91.92	99.28
A	103.46	123.95	111.96	147.39	200.00	160.51	157.23	143.58	121.06	132.86
F	130.68	148.82	136.83	134.39	160.51	200.00	173.72	170.47	135.68	140.84
B	105.83	130.44	111.47	114.24	157.23	173.72	200.00	180.29	137.10	146.52
D	123.75	136.50	113.14	109.45	143.58	170.47	180.29	200.00	145.52	146.11
J	103.99	89.11	73.81	91.92	121.06	135.68	137.10	145.52	200.00	152.68
I	104.57	89.70	77.71	99.28	132.86	140.84	146.52	146.11	152.68	200.00

A: RISEING SON TAVERN 1725-1830

B: BRAY WELL 1770-1790

C: OXON HILL WELL (LOWER) MID 18TH C.

D: OXON HILL WELL (UPPER) MIXED 18TH & 19TH C.

E: OXON HILL MEATHOUSE 1740-1780

F: GRANT TENANCY 1790-1830

G: HAMLIN SITE 1780-1856

H: PHOENIX 1880-1930

I: POPES FREEHOLD 1830-1860

J: HARFORD FURNACE 1830-1880

In general, the faunal analysis of material from the Harford Furnace excavations suggests a reliance on pork as a principal protein source supplemented with beef, poultry, fish, and some wild game. Evidence suggests on-site butchering. The residents probably kept a few pigs and possibly joined in a community network to share an occasionally butchered cow. Time seems to have been spent in some hunting and fishing pursuits, which would have been both recreational and functional.

In some ways, the pattern suggested by the faunal analysis is in sharp contrast with the evidence from the floral analysis. The floral record suggests little time was being directed to crop production, but the faunal record implies the raising of livestock and both hunting and fishing activities. However, it should be noted that many of the preserved meat cuts of the period would not have contained bones. Corned brisket, for instance, is a boneless cut of beef as bacon is a boneless cut of pork. The other principal preserved cuts of pork, cured hams and shoulders, would have contained bones. It is perhaps noteworthy that bones which would have been associated with such hams are the most prevalent post-cranial pig element recovered. Given the large numbers of other artifact classes recovered, it seems that relatively little bone is represented. This does not seem to be a function of preservation, as the bone recovered, while somewhat decayed, was relatively stable. Hence, while some butchering was occurring on-site, it seems likely that additional, preserved meat, was being procured. This is in keeping with the pattern to be expected among individuals employed in wage labor.

Artifact Pattern Analysis

The artifact patterns derived from the excavations at Harford furnace were compared to those introduced by South (1977) and by Garrow (Garrow 1982; Klein and Garrow 1984)(see Table 18). South's two primary artifact signatures are the Carolina Pattern for domestic sites and the Frontier Pattern. In addition, Garrow has defined the Public Interaction Pattern, the Urban Domestic Pattern, and others. Only his Public Interaction Pattern is used in this analysis, since the others do not apply to this site.

Table 19 presents the results of applying the Brainerd-Robinson Index of Agreement (see above) to the artifact pattern analysis. The assemblage recovered from the plowzone and features (excluding the relict creek bed) shows considerable similarity to the Carolina Pattern (Tables 18 and 19). This is in keeping with the site being principally a domestic occupation. The assemblage from the relict creek also is most like the Carolina Pattern of any of the test models. The basic difference between the pattern of material recovered from the relict creek bed and South's Carolina Pattern is the extreme preponderance of domestic material. The pattern is approaching one of pure domestic refuse. This is in keeping with the interpretation of this being an area of primary deposition of domestic debris. In such a case, one would assume little in the way of architectural debris.

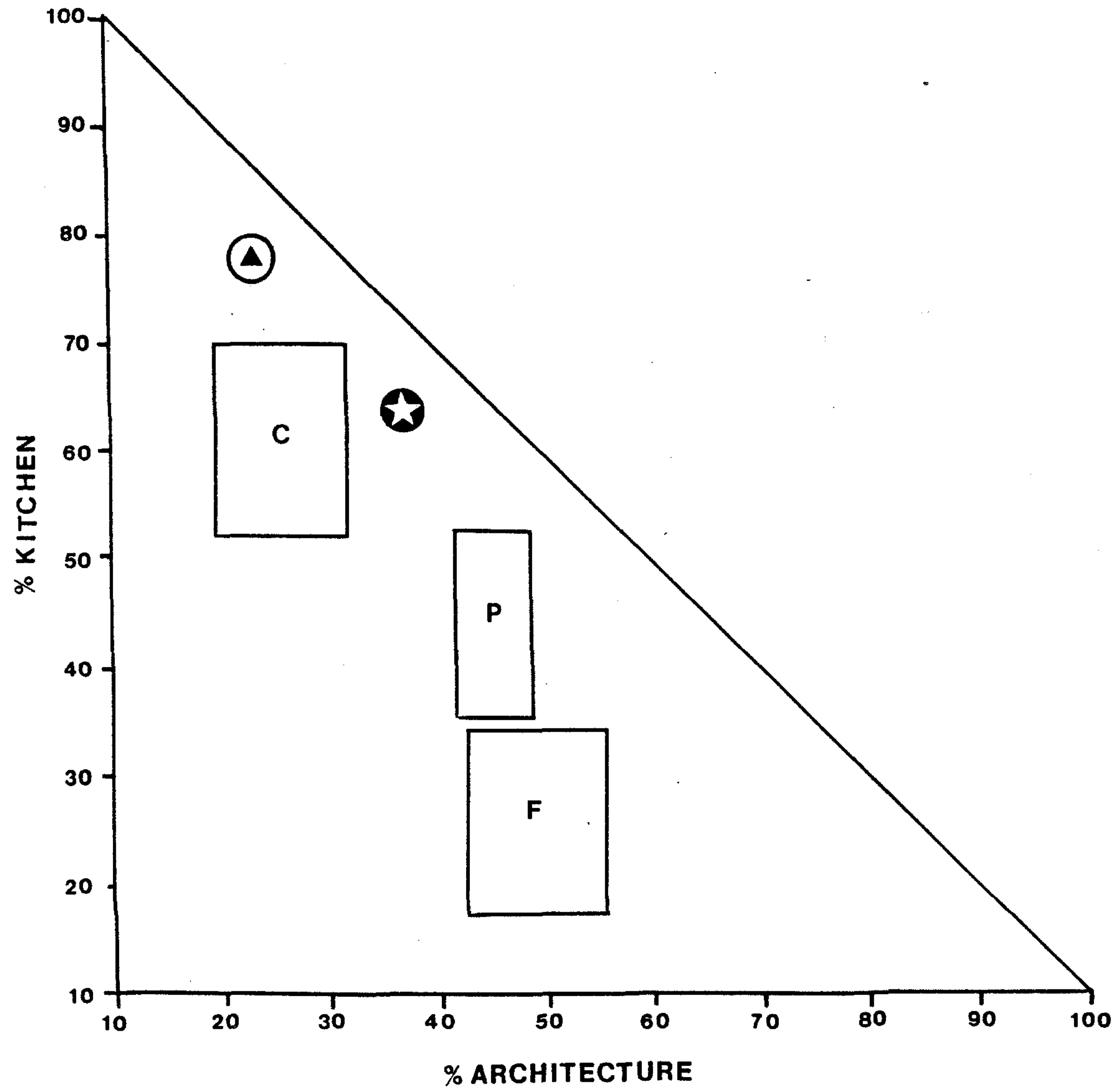
Figure 42 depicts the relationships among these five patterns as a function of kitchen group to architecture group ratios. This figure illustrates the ranges that South and Garrow have proposed for their respective patterns. The patterns are also depicted on a three-pole graph as a function of kitchen to architecture to "other" (all other functional groups excluding architecture and kitchen) ratios (Figure 43). Both of these figures suggest the greatest similarity of the two Harford Furnace samples to the Carolina Pattern.

TABLE 18. Comparison of artifact patterns.

ARTIFACT GROUP	CAROLINA PATTERN	FRONTIER PATTERN	PUBLIC INTERACTION PATTERN	HARFORD HOUSE AREA	CREEK DEPOSIT
KITCHEN	63.1%	27.6%	41.6%	60.2%	73.13%
ARCHITECTURE	25.5%	52.0%	44.0%	34.7%	21.7%
FURNITURE	0.2%	0.2%	0.2%	0.07%	0.25%
ARMS	0.5%	5.4%	2.0%	0.04%	0.0%
CLOTHING	3.0%	1.7%	0.6%	1.1%	3.88%
PERSONAL	0.2%	0.2%	0.1%	0.3%	0.03%
TOBACCO	5.8%	9.1%	8.8%	2.07%	0.65%
ACTIVITIES	1.7%	3.7%	2.7%	1.46%	0.34%
TOTAL	100%	100%	100%	100%	100%

TABLE 19. Brainerd-Robinson Index of Agreement: pattern analysis.

	CAROLINA	HARFORD	CREEK	PUBLIC	FRONTIER
CAROLINA	200.00	181.34	177.79	152.00	126.50
HARFORD	181.34	200.00	126.50	126.50	134.64
CREEK	177.79	126.50	200.00	152.00	104.56
PUBLIC	152.00	126.50	152.00	200.00	172.10
FRONTIER	126.50	134.64	104.56	172.10	200.00



Sources: South 1977; Garrow and Wheaton 1986; Garrow, Personal Communication 1987

= Harford Furnace

▲ = Creek Deposit
C = Carolina Pattern
P = Public Interaction Pattern
F = Frontier Pattern

FIGURE 42. Range of South and Garrow patterns.

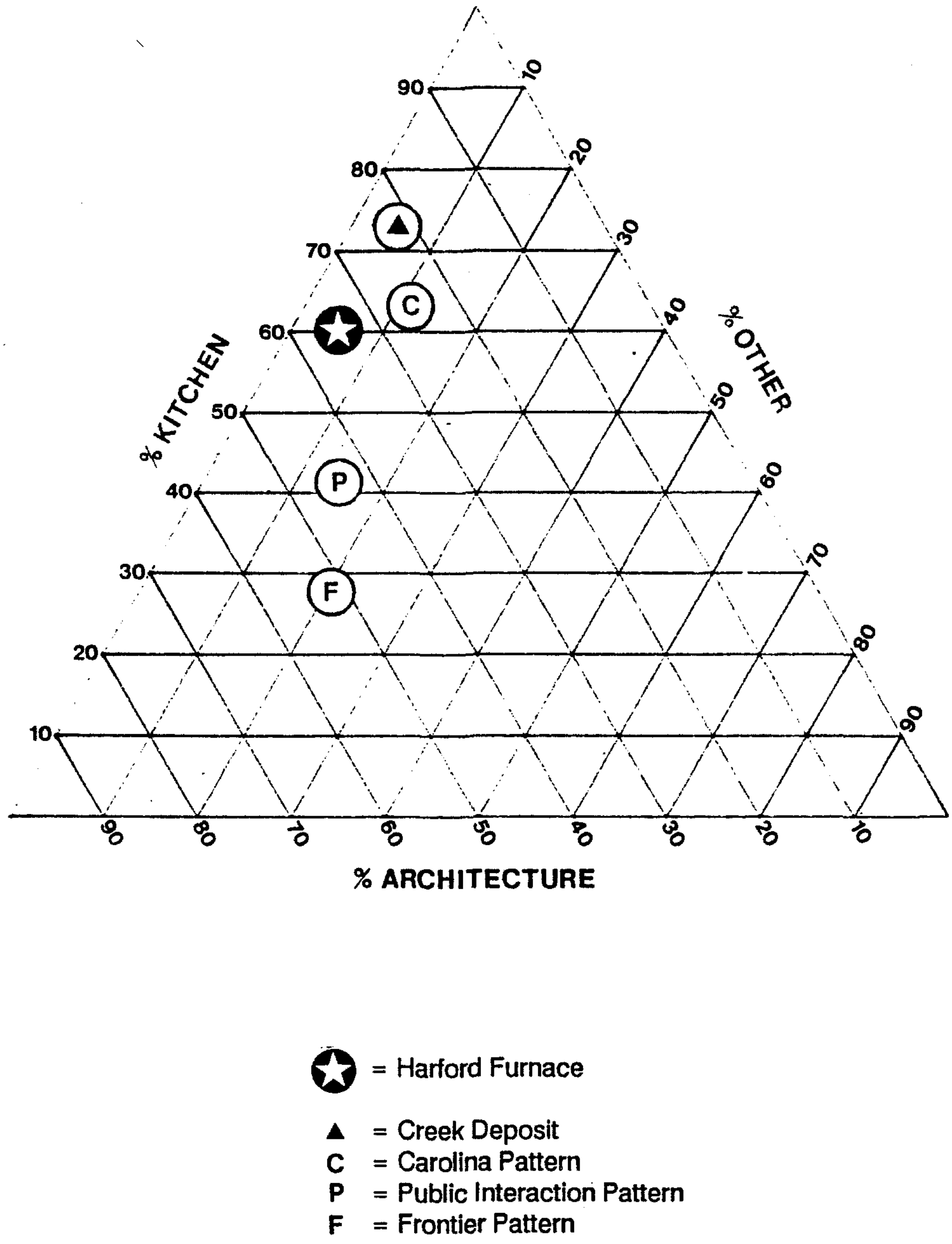


FIGURE 43. Ratio of kitchen to architecture to other artifacts.

In general, the pattern analysis suggests the greatest similarities between the Harford Furnace samples and South's Carolina Pattern. This is not surprising, since the Carolina Pattern is a generalized domestic pattern in which the kitchen group predominates over the architectural group. The extremely low architectural frequency in the creek deposit is a result of the primary deposition of broken and worn out domestic goods. One would assume in such a case that very little architectural material would be broken or discarded. As a domestic occupation, the non-creek assemblage closely mirrors the Carolina Pattern. Indeed, the Carolina Pattern has been tested against sites as far afield as Signal Hill in Newfoundland with similar results (South 1977).

Bottle and Table Glass Vessel Analysis

The glass vessel data are detailed in Appendix V. The minimum glass vessel analysis resulted in identifying 218 bottles and 61 table vessels. The temporal signficance of these items has been described above so that we shall focus here on the functional attributes. Again, the material from the creek deposit will be segregated for this discussion.

The predominant types of vessels in the non-creek assemblage are bottles and panel bottles (Table 20). Together these constitute over 80% of the sample. Looking at probable contents, the major function is the holding of patent medicines and other pharmaceuticals (70.68%). Consumable food items (milk, mustard, and soda) constitute less than 2% of the sample, while intoxicating beverages (beer, wine, and liquor) make up nearly 15%. Clearly, these figures indicate major consumption of purchased medicines and intoxicating beverages with a minimal purchase of prepared foodstuffs packaged in glass vessels.

The collection of bottles from the creek deposit, while much smaller (only 12 vessels), shows a rather different pattern. Only a third of the vessels relate to medicinal products while a quarter are foodstuff and a quarter are for intoxicating beverages (Table 21). This may be a function of the temporal difference, as the mid and latter parts of the 19th century saw a major increase in the availability and use of patent medicines.

Table glass forms from the non-creek assemblage show a predominance of drinking forms. Nearly half of the vessels are drinking glasses, tumblers, wine glasses, or stemmed glasses (Table 22). The remaining forms are divided among drinking-related forms (pitchers), storage or service forms (bowls, dishes, plates, and a cruet stopper), and one hygienic form (a possible eye cup). Generally, the table glass reflects the range of vessels available in the period. However, the small number of vessels compared to ceramics (see below) suggests only a minimal reliance on glass as a service medium. Only five table glass vessels were recovered from the creek deposit; hence little can be said about them. Again, drinking vessels predominate and service and storage vessels are present (Table 23). However, with such a small sample, it is not feasible to generalize about the creek deposit.

The bottle and table glass recovered in the excavations at Harford Furnace suggest a reliance on purchased medicinal products and intoxicating beverages and a general, low level of utilization of glass as a table medium. The small number of table vessels suggests a use of other materials, notably ceramics, for these functions. The large quantities of medicinal containers present indicate a considerable cash outlay on such products, with a probable diminishing use of home remedies (see Floral Analysis above).

TABLE 20. Summary of bottle glass vessels from the house area.

BOTTLE	88	42.72%
CONTAINER	1	0.49%
FLASK	1	0.49%
JAR	5	2.43%
LID	3	1.46%
PANEL BOTTLE	83	40.29%
VIAL	25	12.14%
TOTAL	206	100.00%

TABLE 21. Summary of bottle glass vessels from the relict creek.

BOTTLE	6	50.00%
CONTAINER	1	8.33%
FLASK	1	8.33%
JAR	2	16.67%
PANEL BOTTLE	1	8.33%
VIAL	1	8.33%
TOTAL	12	100.00%

TABLE 22. Summary of table glass vessels from the house area.

BOTTLE/DECANTER	1	1.79%
BOWL	8	14.29%
BOX LID	1	1.79%
CONTAINER	2	3.57%
DISH	4	7.14%
EYE CUP	1	1.79%
DRINKING GLASS	14	25.00%
HANDLE	3	5.36%
HOLLOW	2	3.57%
JAR LID	1	1.79%
PITCHER HANDLE	1	1.79%
PLATE	2	3.57%
STEMMED GLASS	2	3.57%
STOPPER	1	1.79%
TUMBLER	10	17.86%
UNKNOWN	1	1.79%
WINE GLASS	1	1.79%
TOTAL	56	100.00%

TABLE 23. Summary of table glass vessels from the relict creek.

Vessel Type	Count	Percentage
Bowl	1	20%
Cup Handle	1	20%
Stemmed Glass	1	20%
Tumbler	1	20%
Wine Carafe	1	20%
Total	5	100%

Ceramic Vessel Analysis and Economic Scaling

In order to further investigate the occupation at Harford Furnace, a minimum ceramic vessel estimate was produced. The primary purpose for undertaking this estimate was to establish the wealth range of the site occupants following the system suggested by Miller (1980: 5). These vessel estimates were derived for refined dining wares only. The production of a minimum vessel estimate follows, to a great extent, the system used by faunal analysts to determine the minimum number of individuals represented in an archeological sample. This estimate (M.N.I.) is based on the fact that a given individual has only a limited number of bones and by calculating the number of specific osteological elements present in a sample, the minimum number of individuals present can be estimated (White 1953:396).

A minimum vessel estimate is produced by sorting the ceramic sherds into increasingly specific groups. In practice, each unique rim sherd is considered a vessel, each unique basal sherd not attributable to a rim is considered a vessel, and finally, each unique body sherd not assignable to either a rim or a base is considered a vessel. As with table and bottle glass, vessel completeness is noted in Appendix XII following a modified form of the method proposed by Fine (1982): Class "A" vessels are complete from rim to base, Class "B" vessels are represented by rims only, Class "C" vessels are represented by both rim and base which do not mend, Class "D" vessels are represented by basal sherds which cannot be associated with a rim, and Class "E" vessels are unique body sherds not attributable to either a rim or base. Vessel form is described using the standard form terms used by ceramicists and archeologists (primarily cup, saucer, plate, and bowl) and have implicit functional attributes. Additional, specialized forms are identified when possible (platters, creamers, etc.) and three general categories, flat, hollow, and "?" are utilized for vessels whose functional forms could not be determined with any degree of certainty (generally extremely fragmentary vessels).

For purposes of this analysis, the vessels were divided into two study groups: the relict creek bed and the rest of the assemblage. Individual vessels are described in Appendix XII. Looking first at the non-creek bed assemblage (Table 24), we see that the predominant type is undecorated (27.49%), followed by transfer printed (21.38%), painted (17.52%), edge decorated (17.11%), dipped (9.16%), ironstone (5.3%), and finally sponged (2.04%). In regards to identifiable vessel form, plates are predominant (57.79%), followed by bowls (21.29%), cups (9.51%), and saucers (6.08%). Miscellaneous vessels (boats, coffee pots, creamers, platters, etc.) make up

TABLE 24. Summary of ceramic vessels from the house area.

		#	%
BOWLS	DIPPED	7	31.82%
	PAINTED	7	31.82%
	PLAIN	5	22.73%
	TRANSFER	3	13.64%
	TOTAL	22	100.00%
		#	**%**
CUPS	PAINTED	8	66.67%
	TRANSFER	4	33.33%
	TOTAL	12	100.00%
		#	**%**
PLATES	EDGED	37	64.91%
	PAINTED	5	8.77%
	PLAIN	5	8.77%
	TRANSFER	10	17.54%
	TOTAL	57	100.00%
		#	**%**
PLATTERS	EDGED	2	50.00%
	IRONSTONE	1	25.00%
	TRANSFER	1	25.00%
	TOTAL	4	100.00%
		#	**%**
SAUCERS	IRONSTONE	1	20.00%
	PAINTED	1	20.00%
	PLAIN	2	40.00%
	TRANSFER	1	20.00%
	TOTAL	5	100.00%
		#	**%**
?	PAINTED	3	60.00%
	PLAIN	1	20.00%
	TRANSFER	1	20.00%
	TOTAL	5	100.00%
		#	**%**
CHAMBERS	PLAIN	1	50.00%
	TRANSFER	1	50.00%
	TOTAL	2	100.00%

		#	%
CREAMERS	DIPPED	1	100.00%
		#	**%**
FLAT	DIPPED	1	4.00%
	PAINTED	13	52.00%
	SPONGED	3	12.00%
	TRANSFER	8	32.00%
	TOTAL	25	100.00%
		#	**%**
HOLLOW	DIPPED	10	24.39%
	PAINTED	11	26.83%
	PLAIN	4	9.76%
	SPONGED	2	4.88%
	TRANSFER	14	34.15%
	TOTAL	41	100.00%
		#	**%**
SALT	PAINTED	1	100.00%
		#	**%**
TEAP.LID	TRANSFER	1	100.00%
		#	**%**
TEAPOT	PLAIN	1	100.00%

SUMMARY

	#	%
BOWLS	22	12.43%
CUPS	12	6.78%
PLATES	57	32.20%
PLATTERS	4	2.26%
SAUCERS	5	2.82%
?	5	2.82%
CHAMBERS	2	1.13%
CREAMERS	1	0.56%
FLAT	25	14.12%
HOLLOW	41	23.16%
SALT SHAKER	1	0.56%
TEAP.LID	1	0.56%
TEAPOT	1	0.56%
TOTAL	177	100.00%

less than 6% of the identifiable forms. (Otherwise unidentifiable hollow, flat, and "?" forms were removed from the calculations).

The assemblage from the relict creek bed (Table 25) seems to suggest a higher degree of decoration. Here, painted vessels predominate (27.68%), followed by transfer printed (24.86%), edge decorated (22.03%), dipped and undecorated (both 10.73%), sponged (2.82%), and finally ironstone (1.11%). In terms of identifiable forms, the creek assemblage is rather similar to the non-creek assemblage. Again plates are predominant (53.77%), followed by bowls (20.75%), cups (11.32%), and saucers (4.72%). In this data group, nearly 9.5% of the identifiable vessels represent specialized forms (platters, creamer, chamber pots, teapots, etc.). (Again, otherwise unidentifiable hollow, flat, and "?" forms were excluded from these calculations.)

In general, the two study groups (creek bed and non-creek bed) are relatively similar, with a few important differences. The creek bed assemblage shows a much higher degree of decoration than the material more directly associated with the domestic unit. This is a result of the type of deposition each group represents. If, as hypothesized, the creek deposit resulted from a short term, relatively early, primary deposition it should reflect the styles and tastes popular in that time period, while the generally later house-related group represents 50 years of occupation and associated use-breakage, with primary deposition occurring off-site. The small number of ironstone vessels in the creek deposit fits well with an early, short-term deposition as this ware and the associated low level of decoration gained in importance and popularity later in the period of the site occupation. In sum, the differences between the two assemblages reflect differences in time period and depositional habit.

The most practical means of assessing the economic status of the occupants of Harford Furnace is through the use of comparison to temporally and/or socially similar economic groups elsewhere. In order to be effective, any such analysis must measure some attribute related to wealth and/or status and be able to effectively identify similarities and dissimilarities. George L. Miller's (1980) "Classification and Economic Scaling of 19th Century Ceramics" offers just such a tool. Utilizing 19th century pricing lists and wholesale bills, a series of index numbers for different decorative techniques on refined earthenwares was developed. These values are expressed in terms of cost above undecorated ceramics. Using 1.0 as the value of undecorated cream-colored earthenware, the cost above is expressed as a decimal factor such as 1.2, 2.0, etc. The fluctuation of the values of various decorations over time necessitates multiple scales which reflect these shifts (Miller 1980:5).

In order to use Miller's method, one need only undertake a minimum vessel estimate and apply the appropriate scale to the resulting data. Then, by comparison with other collections, the relative wealth of the site is determined. This method of analysis gives one an expression of how much above the bare minimum one is investing in dining wares. In practice, this should be a good measure of willingness to dispose of wealth on a "status" item. Since ceramics are used and broken, a significant number of bits of data are generated and this allows one to generalize more effectively. However, other factors influencing ceramic purchases may be at play. Areas isolated by poor transportation systems have a lower availability of ceramics since potential breakage and freighting costs can necessitate substitution for elements of the ceramic assemblage (Miller and Hurry 1983). However, the Harford Furnace location, with water transport access to the port of Baltimore, and

TABLE 25. Summary of ceramic vessels from the relict creek deposit.

		#	%
BOWLS	DIPPED	12	21.43%
	PAINTED	8	14.29%
	PLAIN	27	48.21%
	TRANSFER	9	16.07%
	TOTAL	56	100.00%
		#	%
CUPS	IRONSTONE	11	44.00%
	PAINTED	3	12.00%
	PLAIN	6	24.00%
	TRANSFER	5	20.00%
	TOTAL	25	100.00%
		#	%
PLATES	IRONSTONE	6	3.95%
	EDGED	82	53.95%
	PAINTED	9	5.92%
	PLAIN	24	15.79%
	TRANSFER	31	20.39%
	TOTAL	152	100.00%
		#	%
PLATTERS	EDGED	3	100.00%
		#	%
SAUCERS	IRONSTONE	8	50.00%
	EDGED	1	6.25%
	PAINTED	2	12.50%
	PLAIN	2	12.50%
	TRANSFER	3	18.75%
	TOTAL	16	100.00%
		#	%
	DIPPED	3	13.64%
	EDGED	1	4.55%
	PAINTED	11	50.00%
	PLAIN	1	4.55%
	TRANSFER	6	27.27%
	TOTAL	22	100.00%
		#	%
BOATS	TRANSFER	2	100.00%
		#	%
CHAMBERS	PLAIN	4	100.00%
		#	%
COFFEE POT	TRANSFER	1	100.00%
		#	%
LIDS	TRANSFER	1	100.00%

		#	%
CREAMERS	TRANSFER	1	50.00%
	PLAIN	1	50.00%
	TOTAL	2	100.00%
		#	%
FLAT	IRONSTONE	1	1.67%
	PAINTED	25	41.67%
	PLAIN	8	13.33%
	SPONGED	6	10.00%
	TRANSFER	20	33.33%
	TOTAL	60	100.00%
		#	%
HOLLOW	DIPPED	30	20.55%
	PAINTED	28	19.18%
	PLAIN	61	41.78%
	SPONGED	4	2.74%
	TRANSFER	23	15.75%
	TOTAL	146	100.00%
		#	%
PITCHER	TRANSFER	1	100.00%
		#	%
TEAP.LID	TRANSFER	1	50.00%
	PLAIN	1	50.00%
	TOTAL	2	100.00%
		#	%
TUREEN	TRANSFER	1	100.00%
	SUMMARY		
		#	%
	BOWLS	56	11.34%
	CUPS	25	5.06%
	PLATES	152	30.77%
	PLATTERS	3	0.61%
	SAUCERS	16	3.24%
	?	22	4.45%
	BOAT	2	0.40%
	CHAMBERS	4	0.81%
	COFFEE POT	1	0.20%
	CREAMERS	2	0.40%
	FLAT	60	12.15%
	HOLLOW	146	29.55%
	LID	1	0.20%
	PITCHER	1	0.20%
	TEAP.LID	2	0.40%
	TUREEN	1	0.20%
	TOTAL	494	100.00%

its proximity to the highway connecting Baltimore and Philadelphia, would not have lesser access to ceramics. Hence, the effects of isolation would not be felt.

One additional problem in applying the system to archeological samples is that only plates, cups, saucers, and bowls appear often enough in the wholesaler's bills and pricing agreements to allow for development of comparative scales. Specialized dining forms such as vessel tops, tea pots, sugar bowls, platters, and hygienic forms such as basins and chamber pots cannot be scaled into the system. Very few of these specialized forms are represented in our sample. Therefore, the lack of scale figures for these unusual forms should present only a minor problem.

For our analysis we have used Miller's 1855-7 ceramic index scales for the non-creek assemblage and his 1838, 1839, and 1846 scales for the creek assemblage (Miller 1980:26, 30, 33). This was deemed necessary since these scales include the decorative techniques in our ceramic assemblage and fit relatively well with the contexts' known dates. Where necessary, scale values have been estimated from adjacent scales when the decorative type under consideration does not occur in these scales. Additionally, Miller's scales for plates are based on specific size categories. Since many plates in the collection are too fragmentary to estimate diameter, the scales for different size categories have been averaged. These slightly modified scales have been applied to our data in the following section.

It should be noted that Miller is currently actively researching the question of relative cost of ceramic decoration. This research is keyed to refining the existing scales and developing new scales for earlier and later periods (George Miller, personal communication 1987). Henry (1987a) has developed scales for the early 20th century; however, these were judged not to be applicable to the current study as they reflect later ceramic types. Needless to say, our current application of ceramic indices of wealth is quite preliminary and subject to modification as new research emerges.

Comparison to published examples by Miller suggest that our sample indicates a wealth level comparable to industrial tenants elsewhere. Table 26 summarizes the wealth analysis while Figure 44 illustrates graphically the index values by form derived from our vessel analysis (generalized hollow, and unidentifiable flat forms and specialized forms are excluded). One other group in Miller's examples (the country tavern) demonstrates a much higher wealth level. In terms of willingness to dispose of wealth on "luxury" items, both the creek assemblage and the material recovered from around the domicile suggest a reasonable level of wealth.

The most significant finding of this analysis is that the material around the domicile suggests a relatively high wealth standard for the industrial tenants who occupied it. This may appear somewhat surprising since one would tend to assume that the landless are materially poor. However, industrial tenants are involved in a fully cash economy which differentiates them from their agrarian counterparts. While these industrial tenants may have been paid in script rather than specie, it was still possible to redeem the script at the company store. Unlike tenant farmers, industrial tenants did not consume the fruits of their labors directly. It was possible, therefore, for them to achieve a relatively high level of material culture in spite of owning no land.

The creek assemblage suggests a rather similar pattern of economic well-being. Given the more restricted time period for the creek deposition, the pattern

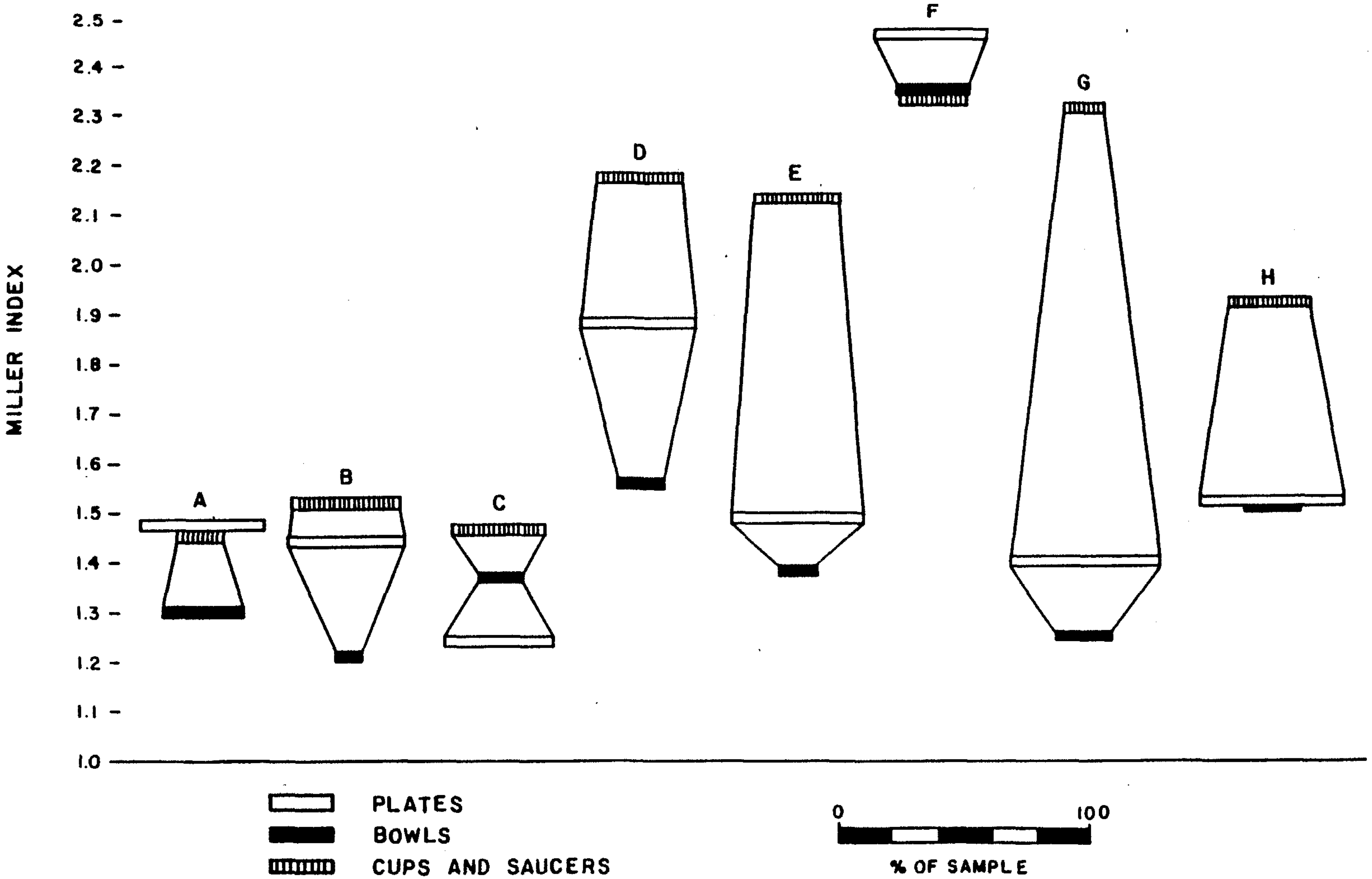
TABLE 26. **Economic scaling by ceramic indices.**

HOUSE AREA (1857 scale)

form	number	percent	index
Plates	152	61.04%	1.39
Bowls	56	22.49%	1.24
Cups	25	10.04%	2.35
Saucers	16	64.26%	2.46
TOTAL	249	100.00%	
Saucers and Cups combined	41	16.47%	2.30

CREEK DEPOSIT (1838,1839, and 1846 scales)

form	number	percent	index
Plates	57	59.38%	1.51
Bowls	22	22.92%	1.50
Cups	12	12.50%	1.94
Saucers	5	5.21%	1.98
TOTAL	96	100.00%	
Saucers and Cups combined	17	17.71%	1.95



A = Tenant Farmer c. 1800
B = Tenant Farmer c. 1840-1860
C = Frontier Log Cabin c. 1810-1832
D = Glass Worker's House c. 1824-1832
E = Glass Factory c. 1824-1832
F = Country Tavern c. 1834-1850s
G = Harford Furnace House
H = Relict Creek

FIGURE 44. Economic scaling (after Miller 1980).

of wealth that emerges is indicative of the wealth of the ironworkers during the Richard Green period of Harford Furnace. This is perhaps a more important observation since it probably results from only a decade of deposition.

The application of Miller's scheme of economic scaling through ceramics suggests that the residents of the domicile uncovered by the excavations at Harford Furnace had a moderate wealth range. In spite of not owning their domicile, the individuals had a reasonable amount of wealth to dispose of on ceramics. This is probably a function of being wage laborers who were paid in cash or script which was easily redeemable at the company store. The creek deposit represents the ceramic acquisitions of perhaps only two families of ironworkers for only a short period. As such, it indicates a reasonable level of economic well-being and a willingness to dispose of wealth on portable goods from the earliest period of the *occupation at Harford Furnace.*

LANDSCAPE RECONSTRUCTION

The following is a brief landscape reconstruction based on the results of the current study and preceeding studies. Figure 45 illustrates a "macro" view of Harford Furnace which relies on both historical maps and archeological research. Figure 46 is a detail of Area 1 where most of our efforts were focused.

The alignment of Creswell Road (Maryland Route 543) appears generally unchanged from 1858 onwards. East of the road is the location of the headrace which diverted water from James Run to power the blast for the furnace. The race was probably transported by aerial flume over Creswell Road to the actual site of the furnace. North of the race, before it crosses the road, was a dry laid retaining wall and steps which provided access to the company store. The company store is a standing structure which has now been converted to a residence. West of Creswell Road and northwest of the company store is a structural foundation which was identified in the Phase II investigations. This structure appears to be the same as a building on the Jennings and Herrick map. Southwest of this structure, near the terminus of the head race described above, is what the previous investigators have identified as the principal industrial locus of the Harford Furnace Company. Here, the possible foundation of the furnace stack, the pit for the waterwheel which would have captured the hydraulic energy provided by the headrace, and a charcoal house which has been converted into a residence were located. The charcoal house was probably built during Dietrich's tenure (dates 1867-1878) at the property and relates to the chemical manufactory which replaced the ironworks (Parrington 1985:20). Leading to this primary industrial locus from Creswell Road is a slag-metaled road which was identified in our excavation. This road passes just north of an ironworkers' house identified in the current research within Area 1.

The house in Area 1 is placed with its long axis on an east-west orientation with a formal face to the south and service yards to the north. The structure has been defined as an ironworkers' duplex, housing two family units. The service yard to the rear is defined by fence lines: an east-west plank fence and a north-south woven or barbed wire stock fence which probably cornered on the northwest corner of the house. Within the "back" service yard was a privy, and west of the service yard were drainage ditches of unknown function. South of the house was a relict creek bed which had probably been filled with domestic debris by the house occupants and capped with slag from the furnace by 1845.

Much of Harford Furnace remains to be explored. Historic maps indicate numerous structures along Goat Hill Road which probably provided housing for additional industrial workers. Historic accounts indicate lime kilns, a gristmill, a blacksmith shop, and numerous other industrial buildings yet to be identified in the field. Much of the Harford Furnace community seems to be well-preserved, buried in the ground awaiting future research.

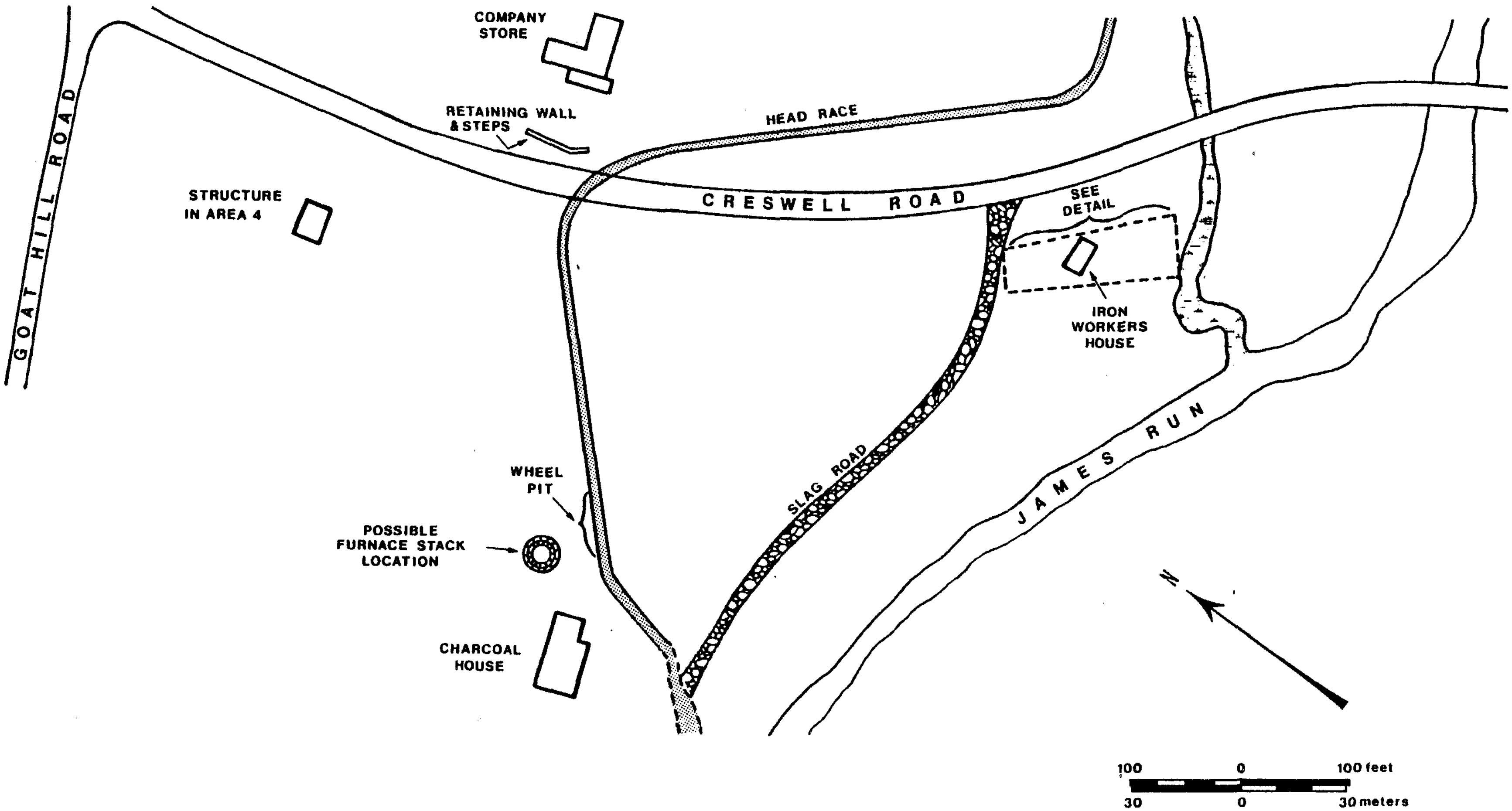


FIGURE 45. Landscape reconstruction - Harford Furnace.

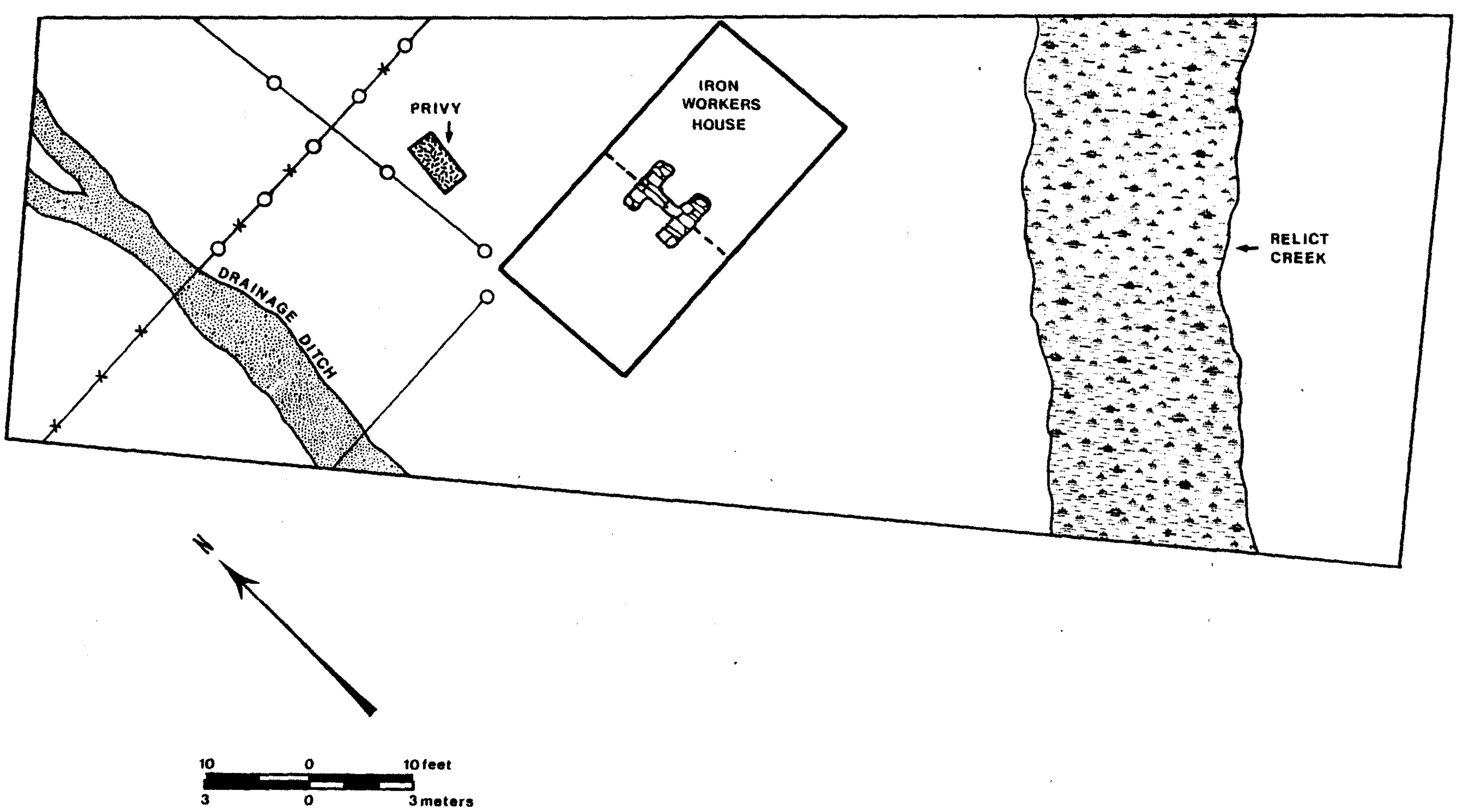


FIGURE 46. Landscape reconstruction detail - Area 1.

SUMMARY AND CONCLUSIONS

The archeological investigations at the Harford Furnace site discovered a rich record of the life and times of industrial workers dwelling in a rural setting. Two general types of cultural deposition were uncovered and investigated. The relict creek channel represents a short-term primary trash deposit from the earliest years of the site occupation; other features and the plow integrated horizons sampled in the random tests contain secondary and tertiary deposition and yard midden from over fifty years of occupation by several different families. The creek deposit appears to contain only a decade of domestic debris dating from the mid 1830s to the mid 1840s. The material from the other excavations suggest an occupation lasting until the 1880s. After site abandonment the area was plowed and utilized for agriculture before reverting to forest.

Historical data make it clear that the occupants of the house were most likely foreign-born, first generation immigrants. The architectural form suggests that two families were probably in residence at any given time with a family make-up of husband, wife, and three children (based on census data). These were young families, with the adults primarily in their mid-thirties. It appears that few of these industrial workers stayed in the same profession for more than a decade, opting instead for more specialized craft pursuits or farming.

The living environment for these industrial workers was not particularly comfortable, even bleak. With two families sharing the industrial duplex, living conditions were cramped. The house appears to have been unplastered on the interior, which would have led to a rather drafty existence. The only source of heat was a hearth in each of the downstairs rooms. This would have been the location for cooking as well as for heating the dwelling. Although probably cold in the winter, the house would also have been quite hot in the summer. These somewhat uncomfortable living conditions are not at all atypical for Americans in the 19th century. Indeed, with the exception of the lack of interior plastering, this type of dwelling was quite the norm for the time period in rural settings.

The site occupants seemed to have followed a rather normal space utilization strategy. The front yard was kept fairly trash-free and was probably maintained as a rather formal area. The enclosed back yard seems to have functioned as a service and activity area. The privy was located there. In general, this division of space between a formal front yard and a service-oriented back yard is typical of historic sites in the United States following from an ideal of the compartmentation of space and activity. Our industrial tenants do not seem to have used space differently than most other citizens.

The diet of the industrial tenants at Harford Furnace does not appear markedly different from what could be considered a generalized American diet of the period. The paucity of floral and faunal remains suggests that processed grains (flour) and purchased vegetables in concert with preserved meat cuts (brisket, bacon, and ham) constituted the diet. Based on the absence of medicinal plant remains and the abundance of patent medicine bottles, it appears that this aspect of lifeways was addressed via purchase rather than home production. However, all of this is essentially speculation. The sparsity of hard evidence (bones and seeds) strongly supports a procurement strategy of purchase of foodstuffs rather than self-production.

The cultural debris recovered from the excavations indicates that while the site occupants were not wealthy, they were by no means materially poor. Being part of a cash economy exchanging their services directly for specie or script, these industrial tenants had considerable disposable income. Rather than using their time to raise crops and medicinal herbs, the occupants exchanged their labor for capital that was then exchanged for food and patent medicines. Income was used for the purchase of moveable wealth rather than invested in their dwelling. This was an extremely logical stategy since the ceramics and other moveable wealth could be taken with them when they had accumulated sufficient capital to purchase their own land. It is at that point in their lives that they would have begun investing in modifying their living environment by improving their now self-owned dwellings.

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APPENDIX I

ABORIGINAL ARTIFACTS

by Maureen Kavanagh

APPENDIX I
ABORIGINAL ARTIFACTS

A small quantity of aboriginal material was recovered during the excavations at Harford Furnace. These probably resulted from short occupations of the site area. However, the subsequent historic activities in the same location thoroughly disturbed the context of the material. All of the artifacts were recovered from plowzone or historic features.

The material recovered is listed in Table 27. Diagnostic projectile points include a Lamoka (Ritchie 1971), a Selby Bay (Mayr 1972), two Levanna, and one Madison (Ritchie 1971). These suggest Late Archaic, Middle Woodland, and Late Woodland occupation. The diagnostic ceramics include one Selden Island sherd (Slattery 1946) and three Accokeek sherds (Stephenson and Ferguson 1963) that are assignable to the Early Woodland, and two possible Late Woodland sherds. Quartz was the predominant lithic material, with chert, rhyolite, and ironstone also present.

Of particular note at this site are 10 fragments of steatite. Only one of them appears worked and looks like a portion of a rim. This site is not too far from documented aboriginal soapstone quarries (Brown 1980). These quarries occur in serpentine deposits which concentrate in northeastern Harford County. Unfortunately the scattered, disturbed nature of the artifact sample makes it difficult to elaborate other than to note this material and suggest that other sites along the terraces and floodplains of the river tributaries in Harford County might show evidence of aboriginal steatite transfer.

TABLE 27. Aboriginal artifacts from 18HA148.

CERAMICS

3 eroded quartz-tempered sherds with micaceous sandy paste
1 eroded quartz-tempered sherd
1 thick cord-marked quartz-tempered sherd
1 cord-marked quartz and sand-tempered sherd
1 cord-marked steatite and sand-tempered sherd
1 cord-marked sand-tempered rim sherd
2 shell-tempered (?) sherds
6 unknown temper sherds

LITHICS

Tools

1 quartz projectile point--Lamoka
1 quartz projectile point--Madison
1 quartz projectile point--Levanna
1 jasper projectile point--Levanna
1 rhyolite projectile point--Selby Bay
1 jasper biface fragment
1 rhyolite projectile point--Selby Bay
1 jasper biface fragment
1 quartz biface fragment
1 retouched primary flake, quartz
1 retouched secondary flake, quartz

Debitage

43 secondary flakes, quartz
13 primary flakes, quartz
6 secondary flakes, chert
3 secondary flakes, rhyolite
1 secondary flake, ironstone
5 quartz shatter
3 quartz chunks
2 quartz cores
1 split quartz cobble
1 quartz cobble, unworked
2 fire-cracked rocks

STEATITE

10 fragments--one worked (rim fragment)

OCHRE

2 chunks red ochre

APPENDIX II

HARFORD FURNACE CHAIN OF TITLE

by Silas D. Hurry and Alison J. Helms

APPENDIX II
HARFORD FURNACE CHAIN OF TITLE

In 1830, John Kirk, John Withers, and Samuel Irwin joined in an indenture to establish "a furnace on the James Run called the Harford Furnace" (Harford County Deed Book HD13:195). It seems quite likely that the Bush Iron Works was no longer functioning at this time as the ore banks could not have supported two furnaces (Parrington 1985:10). In 1831, John Withers sold his one-third interest in the furnace to Joseph and Edward Patterson of Baltimore City (Harford County Deed Book HD14:101). In May 1833, John Kirk sold his portion of the concern to Richard Green, while Samuel Irwin in November of the same year conveyed his interest to Henry and Joseph Patterson (Harford County Deed Book HD16-147 and 318). The following year Henry Patterson sold his interest in the furnace to his brothers Joseph and Edward (Harford County Deed Book HD17:350). That same year (1834) the parcel of land on which our current research focuses was acquired by Green and the Pattersons from the Vestry of St. Georges Parish (Harford County Deed Book HD18:150). The tract was known as "Part of Nova Scotia and Ranger's Lodge." In 1846 the Pattersons sued Green to bring about the dissolution of their partnership (Harford County Circuit Court Records: Equity No 6 HGD376-286).

At that time a newspaper advertisement described the facility as follows:

VALUABLE IRON WORKS

> IN VIRTUE of an order of Harford County Court, as a Court of Equity, will be sold on Monday, the 2nd day of November, at the Harford Furnace, the said FURNACE, WOOD-LAND, IRON MINES, MILLS, and WHARVES connected therewith. This property comprises about 5000 ACRES, three hundred of which lies on the navigable water of the Patapsco in Baltimore county and the residue lies in Harford county, on and near Bush River. The FURNACE is now in operation, and there are few, if any, works of the kind, which possesses the advantages which these do. The Buildings are extensive, and in good order. They comprise a handsome DWELLING HOUSE, besides a dwelling for the Manager- a sufficient number of Dwellings and Shops for the workmen, necessary to carry on the works, with STABLING, Coal houses, Kilns for making Coal, and all the contrivances in the way of buildings and fixtures, necessary to carry on the Furnace. The mines on the property are extensive, and Iron Ore is obtained with facility from the Mines, and the quantity is sufficient to supply the Furnace for centuries. N.B. - These WORKS are to be sold to settle up the Partnership affairs. They have averaged a profit of TEN THOUSAND DOLLARS per annum for the last fourteen years, and will probably be equally profitable in the future, Tariff or no Tariff.

OTHO SCOTT
Baltimore Republican and Argus
October 1, 1846

Green bought out the Pattersons' interest for $50,000 and acquired a new partner named Walter Fernandis (Harford County Deed Book HGD32:342). By 1857 the new partnership had acquired more than 5,000 acres including the parcel which contained the old Bush Iron Works (Wright 1967:147, 148). By the time of Green's death (1862) his interest in the Harford Furnace property was deeded to William F. Pannell (Harford County Deed Book WG13:146). Pannell in turn deeded what had been Green's interest to Joseph W. Patterson (Harford County Deed Book WG13:149) and immediately leased the whole property from Patterson (Harford County Deed Book WG13:154). This lease was held until 1867 when Pannel sold his rights to Clement Dietrich (Harford County Deed Book WHD19:187). Dietrich in turn borrowed money under the terms of mortgages from a number of individuals during his tenure at Harford Furnace. This culminated in his defaulting on the mortgages and a rancorous court case in 1876, which caused the sale of the property to the benefit of Dietrich's creditors (Harford County Circuit Court 2558G:55). Following is the first of two advertisements for the sale:

> Sheriff's Sale of Harford Furnace By virtue of three writs of fieri facias issued out of the Circuit Court for Harford county, one at the suit of Louis Berger vs. Clement Dietrich, one at the suit of Armstrong, Chiter & Co., vs. Clement Dietrich, and the other at suit of J. Wilder & Co. vs. said Dietrich against the goods and chattels, lands, and tenements of Clement Dietrich, to me directed, I have levied upon and taken in execution all the right, title, claim, interest, and estate, both at law and in equity, of the said Clement Dietrich and to all those Tracts or Parcels of Land situate and lying in Harford county, containing in the aggregate 5878 Acres of Land More or Less...
>
> This property is commonly known as the Harford Furnace Property. The improvements consist of Iron Furnace, Chemical Works, Grist and Saw Mills, Store Houses, Lime Kilns, a large number of Tenant Houses, and an elegant Mansion House, and there are on the property several Iron Ore Banks, of superior quality of ore. All machinery is in working order. Also all the right, title, interest, claim, and demand of the said Dietrich in and to the following Personal Property now in his possession and on the above described real estate. To Wit: Sixty-two mules, 8 Horses, 10 Heavy Wagons and 1 light one, 3 carriages, 4 set Double Harness, 2 Rockways, 1 Express Wagon, 4 sets Single Harness, 12 Carts and Harness for same, 5 yoke Oxen, 8 Cows, 6 Heifers, 1 Bull, 1 pair Timber Wheels, and the Farming Tools and Implements, Wagon Gears, Harness and equipment of said Dietrich, Store Goods now in the store, Stock in Chemical Methyl and Carbonization Buildings, All the Implements, Utensils, Vessels, Tools and Machinery in and about the Furnace and manufacturing establishments aforesaid and in and about the Mills, shops and on the lands and premises heretofore described and also all the in stock, Iron, Copper and other metal on said property, and all the

Grain in the mill, Also Wheelwright and Cooper stuff, and the lumber in and about the saw mill. Also bricks and Carboys, Stone Coal in and about the aforesaid property, Also all the Household and kitchen Furniture of said Dietrich, Also about 5,000 Cords of Wood, and on the bank at said works and in the woods on the above lands...

The Aegis
February 18, 1876

According to the records of the court case, the advertisements for the sale appeared in newspapers in Baltimore, Philadelphia, and New York, in addition to being published in Harford County. The second advertisement provides more detail on the nature of the chemical works:

TRUSTEES' SALE OF VALUABLE CHEMICAL WORKS, IRON FURNACE, MILLS, IRON ORE BANKS, AND FARMING LANDS, &C., &C., BY virtue of decrees of the Circuit Court for Harford county, sitting in Equity, the subscribers, as trustees, will offer at Public Sale, at the Harford Furnace, on WEDNESDAY, JUNE 14TH, 1876, At 11 'clock, A.M., all that real estate and property known as "THE HARFORD FURNACE & CHEMICAL WORKS," Situated in Harford county, Md., about three miles from Perrymansville Station, on the Philadelphia, Wilmington and Baltimore Railroad, containing the aggregate 5,873 ACRES, MORE OR LESS, TOGETHER WITH ALL THE BUILDINGS, WORKS, MACHINERY AND IMPLEMENTS, Located theron. This property will be sold in three parcels or divisions. FIRST PARCEL Contains all the lands formerly known as and called the "HARFORD FURNACE PROPERTY," and contains 5056 ACRES MORE OR LESS, Being the same and all the lands which were conveyed by William F. Pannell and wife to Clement Dietrich, by deeds bearing date October 2d, 1867, and recorded in Liber W. H. D., No. 19, folio 187, one of the Land Records of the Circuit Court for Harford county. Upon this division of the real estate are located ONE CHARCOAL IRON FURNACE, Water and Steam Power, of 50 tons capacity per week, with ORE AND CHARCOAL KILNS, all in good order. Also, LARGE CHEMICAL WORKS, For the manufacture of Pyroligneous Acid, Wood Alcohol, Acetic Acid, Sugar of Lead, Acetates, &c., built in a substantial manner, convenient for use and in good order, and consisting in part of CARBONIZATION BUILDING, 100x65 feet, with 24 Cylinders and 8 Furnaces, with capacity of 600 bushels Charcoal and 1,600 gallons Pyroligneous Acid per day. MYTHELENE BUILDING, 60x20 feet, for manufacturing Wood Alcohol-capacity 1,000 gallons per month. BUILDING 200x65 FEET, For manufacturing Acetic Acid, Acetates, &c., with STILLS,

> EVAPORATORS, ENGINES, &c., in working order, with WAREHOUSE 60x30 feet attached, for storing Acids. Also FLOURING MILL, With Water Power, recently put in thorough repair. Also STEAM SAW MILL, 65x50 feet, with Circular and Upright Saw. Also large and handsome STONE MANSION HOUSE, with usual outbuildings. Also STONE DWELLING, STORE HOUSE, WAREHOUSE & OFFICES. Also three comfortable DWELLING HOUSES. Also, 35 DWELLINGS For employees, workmen, &c., Also WHEELWRIGHT, BLACKSMITH, COPPERSMITH, COOPER AND HARNESS SHOPS. Also BARNS, STABLES, BARRACKS, and other necessary outbuildings. There are about FOUR HUNDRED ACRES IN CULTIVATION in the vicinity of the Mansion House. Most of the land is in Wood Cuttings, Young Timber, &c., and upon a part of it are IRON ORE BANKS, For the use of the Furnace. The aforegoing lands are sold subject to a Ground Rent of $1,200 per annum, payable semi-annually, 1st of January and July . . .
>
> **The Aegis**
> June 9, 1876

The parcel of land our site is located on was held by Dietrich under the terms of a ground lease only, so the title was not sold in the bankruptcy. Dietrich's holdings were acquired by Henry Archer (a specific deed reference could not be located; however, subsequent deeds refer back to the circuit court ruling). Archer also acquired Patterson's rights to Nova Scotia and Ranger's Lodge (the location of our site) from Reveredy Johnson who had inherited it through Joseph W. Patterson's will (dated January 22, 1866) in 1884 (Baltimore City Wills Book JPC33:417 and Harford County Deed Book ALJ48:340). With Archer's death in 1887, the whole property passed into trusteeship, and was sold to James Walsh in September of 1888 (Harford County Deed Book ALJ60:508). Walsh willed the property to his son James Walsh, and to his widow Mary D. Walsh (Harford County Will Book JMM11:99). The parcel with which we are concerned was deeded by Walsh to Patrick O'Conner and his wife in 1934 (Harford County Deed Book SWC227:499). The O'Conners in turn deeded the parcel to Ella Brandt in 1936 (Harford County Deed Book SWC242:294) who then deeded it to Helen Hutchins in 1938 (Harford County Deed Book SWC251:400). Hutchins held the property until 1941 when she deeded it to Edward and Marion Kerns (Harford County Deed Book GCB269:1) who in turn deeded the property to David and Eleanor Smith in 1949 (Harford County Deed Book GRG331:457). The Smiths held the property until its recent acquisition by the Maryland State Highway Administration.

APPENDIX III

CENSUS RESEARCH

by Alison J. Helms

APPENDIX III
CENSUS RESEARCH

The purpose of this appendix is to define the Harford Furnace community within the censuses and to determine which of the people listed were iron furnace workers. The names of iron furnace workers living in the Harford Furnace area in 1850, 1860, and 1870 are presented in tables with accompanying data on age, sex, ethnicity, marital status, and number of children. This information constitutes the data base used in the demographic analyses in the main text.

The records consulted in this study include the U.S. Population Censuses for 1850, 1860, and 1870 and historic maps of Harford County for the years 1858 and 1878. It was assumed that the census takers recorded their statistics as they proceeded from house to house within a general geographic area and that the people listed next to each other in the census lived near or next to each other in geographic space. It was also assumed that people listed in the census lived near where they worked. However, it was not assumed that the owners of the iron furnace lived near the furnace. These assumptions were tested by correlating names and occupations listed in the census with the names and occupation information provided on historic maps of Harford County.

The Harford Furnace community was thought of as a subset of the Harford County Census. In order to be able to compare the Harford Furnace community of 1850 with that of 1860 and the community of 1860 with that of 1870, it was necessary to define the community consistently in each year.

The community was first loosely identified within each census by the presence of the owner (or owners) of the Harford Furnace Company, the presence of other key people known from historic research to be associated with the furnace, and the presence of people with iron-industry-related occupations and professions. The names on the census were compared with those on the 1858 Jennings and Herrick Map of Harford County to provide additional evidence that people listed in the census were living near Harford Furnace.

It was discovered that the limits of the Harford Furnace community could be defined in a consistent manner within each census by comparing the loosely identified Harford Furnace communities to a specific geographic area. The "Harford Furnace Area" was then defined with a boundary on both the 1858 Jennings and Herrick and the 1878 Martenet maps of Harford County. The boundary was drawn to encompass the Harford Furnace area by using landmarks that occurred on both maps. These landmarks included crossroads, bends in the roads and points where the roads crossed rivers. Slight differences in shape and size of the bounded area between the maps can be attributed to local distortions of scale on the maps as can the apparent change in position of Bynum's Run (west side of the boundary) between 1858 and 1878 (Figures 47 and 48).

The Harford Furnace area as defined on the maps delimited the Harford Furnace community within each census. All the names associated with houses within the Harford Furnace area on the maps were checked against the names listed in the 1850, 1860, and 1870 censuses. People whose names appeared on the maps and in the census were considered members of the Harford Furnace community. The first person listed in the census, whose name also appeared in the Harford Furnace area on the map, was designated the beginning of the Harford Furnace

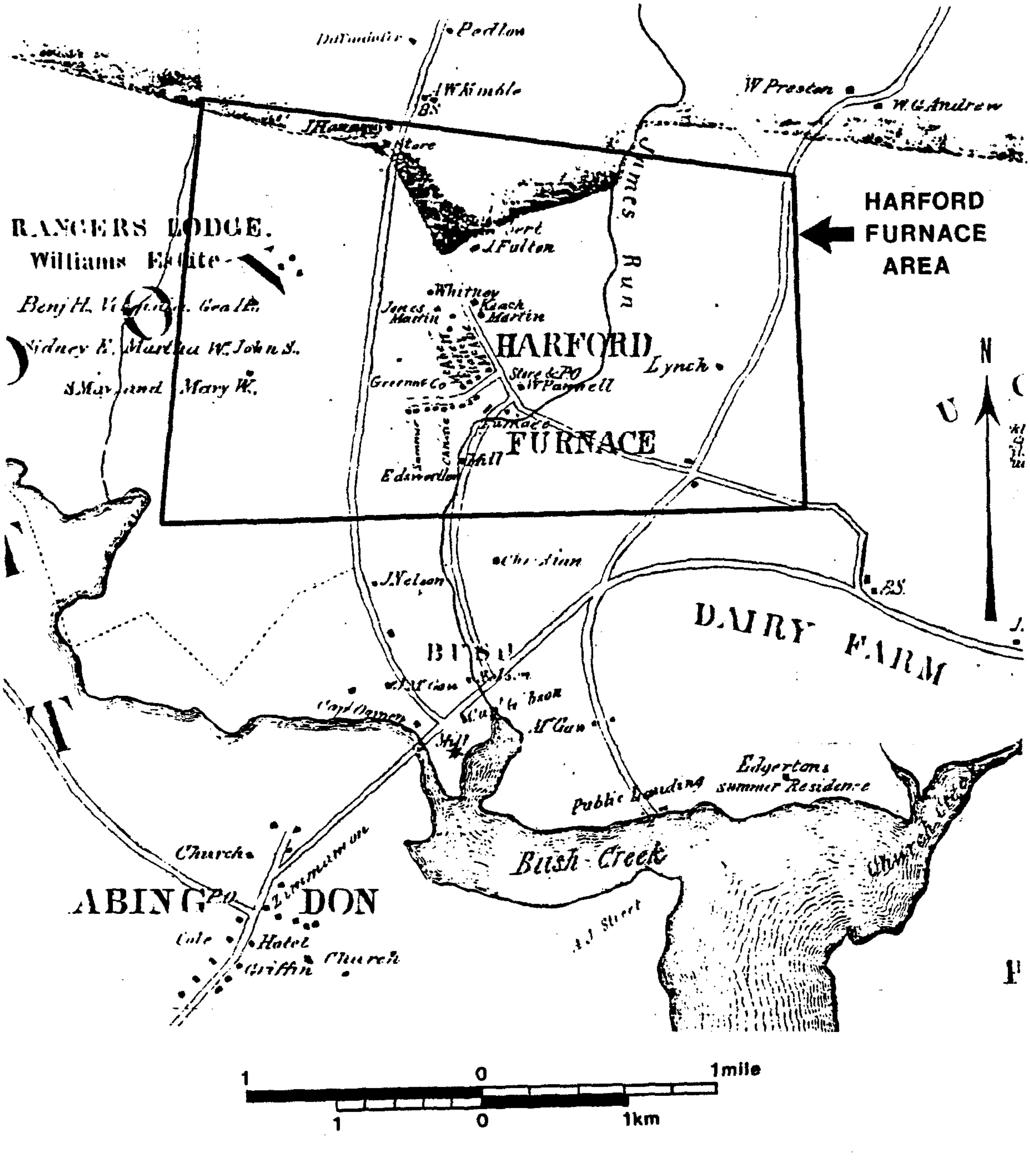


FIGURE 47. Jennings and Herrick Map (1858): Harford Furnace area.

FIGURE 48. Martenet Map (1878): Harford Furnace area.

community. The last person listed in the census who also appeared in the Harford Furnace area on the maps was designated the end of the Harford Furnace community. All people listed in the census between the first appearing and last appearing names were considered members of the Harford Furnace community. This could be done on the basis of an assumption explained earlier - that people listed near or next to each other in the census lived near or next to each other in geographic space.

Once the Harford Furnace community was defined within each census, it was necessary to confirm that industrial occupations in the community were consistent with the industries present within the Harford Furnace area on the maps. Those industries were the iron furnace, grist and saw mills, and possibly (in 1870 only) a wool factory. Occupations listed in the Harford Furnace community section of the census were consistent with the industries present in the Harford Furnace area.

The Harford Furnace community came to be defined in each census as the section of the census judged to represent the Harford Furnace area outlined on the historic maps. In all three censuses, 1850, 1860, and 1870, the section of the census considered to represent the Harford Furnace area included the name of the owner of the Harford Furnace at the time, the names of other people known to be associated with the furnace through historic research, names of people with furnace, grist mill and saw mill related occupations, and the names of those local people whose houses appeared within the Harford Furnace area boundary on the historic maps.

If the Harford Furnace community can be thought of as a subset of the Harford County census, then the iron furnace workers can be thought of as a subset of the Harford Furnace community. It is from the section of each census called the Harford Furnace community that the individual lists of iron furnace workers living and working in the Harford Furnace area for the years 1850, 1860, and 1870 were derived.

Since the Harford Furnace area defined on the map is only approximately 3 miles square, it was thought possible that some iron furnace workers working at Harford Furnace could have been living outside the Harford Furnace area on the map. The census was checked outside what had been defined as the Harford Furnace community to discover if any ironworkers had been missed. No iron furnace workers appeared to be living immediately outside the Harford Furnace community in any of the censuses, though scattered iron miners did appear in the surrounding area in the 1870 census. It was observed that iron furnace workers as a group were very tightly clustered in the 1850 census. In 1860, all were listed under the Harford Furnace Post Office section of the census. In 1870, the iron furnace workers appeared in a more scattered fashion than in the previous two censuses. It is not known if this is a result of the manner the census-takers recorded the information or if in fact the iron furnace workers were more spread out in that year, with some living near Creswell.

Slave labor may have been used at the Harford Furnace in 1850 and 1860, and, if true, the slaves should be added to the lists of iron furnace workers for those years. The slave schedules for 1850 and 1860 were checked in addition to the schedules of free individuals. In 1850, Richard Green, one of the owners of the iron furnace at the time, had two male slaves, and James Christie, the manager of the furnace, also had two slaves, one male and one female. In 1860 James Christie was listed as having one male slave. This was considered negative evidence that there was slave labor working at the iron furnace. It seemed more likely that the slaves were personal servants of Green and Christie.

The following pages define the Harford Furnace community within each of the 1850, 1860, and 1870 censuses. Also discussed is how the lists of iron furnace workers in the Harford Furnace area were determined for each census year.

The section of the 1850 census that was judged to represent the Harford Furnace community was located in the third Election District and second Census District of Harford County. It began with George Williams, Merchant, and ended with Wakeman Martin, blacksmith. This section covered pages 99-104 of the census.

Key people associated with the furnace in addition to Richard Green, the owner of the furnace at the time, appeared in this section of the 1850 census. They are: William Pannell, who later became owner of Harford Furnace; Samuel and Edward Fernandis, probable relations to Walter or Henry Fernandis, men who went into partnership with Green on the Ashland, Oregon, and Harford Furnaces; and James Christie, manager of the furnace, whose name is listed again in the 1860 census. The following people listed in the census also appear on the 1858 Jennings and Herrick map within the boundaries defining the Harford Furnace area: Richard Green (Iron Manf.), William Pannell (clerk), James Christie (Manager furnace), Wakeman Martin (wheelwright), and George, Virginia, Sidney, Martha, and Susan Williams (merchant and daughters).

A list of iron furnace workers was drawn from the section of the 1850 census judged to represent the Harford Furnace community (Table 28). In referring to the census there was some difficulty in deciding who was to be considered an ironworker, because census takers used only the general term "Labourer" to describe certain occupations. Laborers could have worked for any number of businesses, including farms, mills, and the iron furnace. Laborers were not considered iron furnace workers if they followed farmers or other individuals with occupations unrelated to the iron industry. Laborers were also not considered iron furnace workers if they followed wheelwrights or blacksmiths. Laborers appearing in the census immediately after tradesmen may have worked for that tradesman. All the laborers listed immediately after Richard Green were counted as iron furnace workers, a reasonable assumption given that no farmers or other tradespeople are listed within that cluster.

There was a miller listed among the string of laborers considered iron furnace workers and a mill is shown in the Harford Furnace area on the 1858 Jennings and Herrick map. The mill could have been a grist mill, a saw mill, or both; regardless, the number of laborers working the mill would be few compared to the number of iron furnace workers. Mills were often run by one miller. Few, if any, extra laborers were needed. All of the laborers sandwiched between Richard Green and Wakeman Martin were considered ironworkers even though one or two at most might have worked for the mill.

The section of the 1860 Census judged to represent the Harford Furnace community was located in the 1st District - Abingdon, of Harford County, under the Harford Furnace Post Office, beginning with Virginia, Martha and Susan Williams, daughters of George Williams, merchant, deceased, and ending with John Fulton, farmer. This section covered pages 158-164 of the census (see Table 29). Included within this section of the census is William Pannell, the owner of the iron furnace,

TABLE 28. Laborers considered iron furnace workers living and working in the Harford Furnace area in 1850.

Name	Age	Sex	Col	Trade	Birth Place	MS	C
Robert Watson	35	M	W	Labourer	Ireland	M	6
Robert Watson	20	M	W	Labourer	Ireland	S	
John Watson	17	M	W	Labourer	Maryland	S	
Henry Turner	34	M	W	Labourer	Maryland	M	4
Stephen Clark	40	M	W	Labourer	Ireland	M	4
Frederick Gerting	42	M	W	Labourer	Germany	M	5
Henry Gerting	16	M	W	Labourer	Germany	S	
Michael Hambaugh	42	M	W	Labourer	Germany	M	6
Tollin Hambaugh	62	M	W	Labourer	Germany	M	0
Frederick Hessa	45	M	W	Labourer	Germany	M	4
Patrick Clark	25	M	W	Labourer	Ireland	S	
John Leper	37	M	W	Labourer	Prussia	S	
Patrick Farley	28	M	W	Labourer	Ireland	S	
Charles Clark	27	M	W	Labourer	Ireland	S	
Peter McChem	19	M	W	Labourer	Ireland	S	
Dennis McDonald	30	M	W	Labourer	Ireland	S	
Samuel Blacklein	28	M	W	Labourer	Germany	S	
William O'Neill	40	M	W	Labourer	Ireland	S	
Asabel Montgomery	19	M	W	Labourer	Maryland	S	
Thomas Martin	35	M	W	Labourer	Ireland	S	
Patrick McFarlin	44	M	W	Labourer	Ireland	S	
George Hambaugh	40	M	W	Labourer	Germany	M	6
Henry Hall	33	M	B	Labourer	Maryland	M	4
Michael Sarcable	34	M	W	Labourer	Germany	M	2
William Carty	35	M	W	Labourer	Maryland	M	3
James Griffin	31	M	W	Labourer	Maryland	M	4
John Laughlin	33	M	W	Labourer	Maryland	M	1

Key:
Col- Color
MS- Marital Status
C- Children

TABLE 29. Iron furnace workers living and working in the Harford Furnace area in 1860.

Name	Age	Sex	Col	Trade	Birth Place	MS	C
Dennis McDonald	36	M	W	Furnace Man	Ireland	M	3
William Oliver	32	M	W	Furnace Man	Ireland	M	3
John Somers	37	M	W	Furnace Man	Penn.	M	3
John Summers	33	M	W	Furnace Man	(N/A)	M	4
Albert Butler	32	M	W	Furnace Man	Rhode Island	M	1
Samuel Heamer	36	M	W	Furnace Man	Penn.	M	8
Jacob Sills	22	M	W	Furnace Man	Maryland	M	0
William Whiteford	29	M	W	Furnace Man	(N/A)	M	1
David Russel	30	M	W	Furnace Man	Ireland	M	2
Wahnlein	50	M	W	Furnace Man	Germany	S	
Thomas Clark	43	M	W	Furnace Man	Ireland	M	7
George Wheatly	33	M	W	Furnace Man	Maryland	M	1
Charles Brent	25	M	B	Furnace Man	Maryland	S	
Peny Hall	60	M	B	Furnace Man	Maryland	M	4
James Martin	52	M	W	Furnace Man	Ireland	M	0
Robert Wilson	60	M	W	Furnace Man	Ireland	M	0
Adam Cramer	36	M	W	Furnace Man	Penn.	M	3
Johnson	40	M	B	Furnace Man	Maryland	M	6

Key:
Col- Color
MS- Marital status
C- Children

and James Christie, who was manager of the furnace in 1850. A. Henry Strasbaugh, known to have been hired by the Harford Furnace Co. in 1855, was not listed in the census or on the 1858 map. Names listed in the 1860 census which appear on the historic maps within the boundaries of the Harford Furnace Area are: William Pannell (Furnace Prop.), James Christie (Foundryman), Virginia, Martha and Susan Williams (daughters of merchants), John Lynch (Laborer), James McAbee (Wagoner), John or Peter Summers (Furnaceman), John McAbee (Teamster), John Bailey (Teamster), John Everett (Teamster) James Martin (Furnace man), George Gilbert (Miller), Wakeman Martin (Blacksmith), and John Fulton (Farmer).

The census takers were more specific in describing occupations in 1860 than they were in 1850. In this census the "Furnace Man" is listed in addition to "Laborer." All "Furnacemen" were considered iron furnace workers because their professions were unambiguously related to the furnace. All "Laborers" could also conceivably have worked for the iron furnace. The same method for determining whether a "Laborer" worked for the iron furnace in the 1850 census was used in the 1860 census. "Laborers" in the 1860 census who were listed after farmers were not considered iron furnace workers because they worked for the farmer. The one laborer in the 1860 census who did not follow a farmer followed a teamster. It was suspected that he worked for or with the teamster, so he was not included in the list of iron furnace workers. The result of this procedure was that no laborers from the 1860 census were counted as iron furnace workers.

There was a miller listed in the 1860 census, but no other people listed appear to have worked for the mill. Since the census takers noted specifically who worked for the furnace, it is suspected that they would have noted specifically who worked for the mill. Again it is a relevant observation that mills were often one-man operations needing few, if any, additional laborers.

The section of the 1870 census judged to represent the Harford Furnace community was located in the first district of Harford County under the Upper Falls Post Office, beginning with William Pannell and ending with Daniel McComas, farmer. This section of the census covered pages 40-64. Present in this section of the census is Clement Deitrich, the owner of the iron furnace at that time. Also present is A. Henry Strasbaugh, listed as "keeping store," who was William Pannell's brother-in-law and who kept stores in Abingdon and Creswell in addition to the one in Harford Furnace. William Pannell, who had sold the furnace to Clement Deitrich in 1867, also appears in the census. Other people listed in the census whose names also appear within the boundary of the Harford Furnace Area on the 1878 Martenet map are: William Cullom (Farmer), Jessy Cullom (Farmer), John Lylly and Henry Lylly (Woolen Manufacturers), Clement Deitrich (Manufacturer), George Gilbert (Miller), Virginia, Sidney, Martha and Susan Williams (daughters of merchant George Williams, dec.), and Amendis Patterson (Farmer). Wakeman Martin (Blacksmith) who was previously listed in the 1850 and 1860 censuses, is also present in the 1870 census.

In the Harford Furnace area portion of the 1870 census, there are diverse industrial occupations listed. This is in contrast to the 1850 census which listed only millers and laborers and the 1860 census which listed millers, furnacemen, and laborers. The following phrases describing industrial occupations are listed in the Harford Furnace area section of the 1870 census: "in iron works," "iron works," "works in furnace," "works in rolling mill," "colier," "works in factory," "works in saw mill," "laborer," "works in mill," "in chemical works," "machinist," "foundryman," "Engineer," "Miller," "Woolen Manufacture," "runs engine," "Manufacturer," "Civil Engineer."

All of these occupations are consistent with the industries present within the Harford Furnace area boundary on the 1878 Martenet Map of Harford County. There is a grist and saw mill on James Run north of the Furnace operated by George Gilbert, Miller. The presence of this mill within the Harford Furnace area is consistent with the presence of saw mill workers and mill workers in the section of the 1870 census judged to represent the Harford Furnace area. John Lylly (appearing on the map associated with two houses) and Henry Lylly, both in the census, were noted to be in the business of woolen manufacture. This could account for the presence of factory workers in the Harford Furnace area. There is also a possibility that the factory workers worked for the Harford Furnace Company. When Clement Dietrich bought the furnace in 1867 from William F. Pannell, he expanded the business to include a chemical works and the name of the company was changed to "Harford Furnace and Chemical Works." This accounts for the presence of chemical workers and could also account for the presence of engineers, machinists, and factory workers in the area.

In the interest of arriving at a list of the ironworkers in the area for 1870, those people with occupations unambiguously associated with iron production were pulled from the census (Table 30). The following phrases were considered to describe ironworker occupations: "in iron works," "iron works," "works in furnace," and "colier." "Laborers" were not presumed immediately to be ironworkers because they could have worked in any of the industries, for any of the farmers, or for any other tradesmen in the area. Exactly the same precedure for deciding whether a laborer should be on the list of iron furnace workers was used in this census as was used in the 1850 and 1860 censuses. There were only four laborers in the pool of industrial workers. Three were listed immediately after a carpenter, so they most probably worked for him. The fourth laborer was not counted as an iron furnace worker because he followed a teamster. The one "Foundryman" listed in the 1870 census was not considered an iron furnace worker because it was probable that he was managing or supervising the furnace work. The only other "Foundryman" encountered in the examination of the censuses was James Christie in 1860. Christie was described clearly as manager of the furnace in the 1850 census.

Summary

The general pattern that emerges from the census research is one of primarily white, foreign-born, male ironworkers. The age distribution suggests clustering in the thirties and forties. In most cases, nearly half the furnace workers were married, some with offspring. There is a general lack of continuity between the censuses suggesting a relatively transient work force.

TABLE 30. **Iron furnace workers living and working in the Harford Furnace area in 1870.**

Name	Age	Sex	Col	Trade	Birth Place	MS	C
Robert Watson	35	M	W	Labourer	Ireland	M	6
Christian Eagles	26	M	W	Iron works	Canada	S	
Joseph Bramble	28	M	W	Iron works	Maryland	M	
Michael Galien	35	M	W	Iron works	Ireland	M	6
James Lynch	40	M	W	Works in furnace	Ireland	M	3
Robert Gough	35	M	W	Works in Rolling Mill	Maryland	M	4
William Gough	67	M	W	Colier	England	M	1
Pat McGuer	26	M	W	Works in furnace	Ireland	S	
Fred Hess	15	M	W	Works in furnace	Maryland	S	
James Godwin	18	M	W	Works in furnace	Maryland	S	
Franklin Godwin	15	M	W	Works in iron works	Maryland	S	
Henry Myer	20	M	W	In furnace	Hanover	M	2
James Martin	45	M	W	Works in furnace	Ireland	M	4
Wagner Gulfrit	35	M	W	In furnace	Whitten-berg	M	4
Denis McDonel	52	M	W	In furnace	Ireland	M	5
Thomas Clark	48	M	W	In furnace	Ireland	M	4
John Clark	19	M	W	In furnace	Maryland	S	
Martin Michael	28	M	W	In furnace	Ireland	S	
Henry Shellhouse	32	M	W	In furnace	Hessen	M	1
Casiday	30	M	W	Works in Rolling Mill	Maryland	M	1

Key:
Col- Color
MS- Marital status
C- Children

APPENDIX IV

NAILS

by Silas Hurry

APPENDIX IV
NAILS

The temporal limits of nails from Harford Furnace have been previously discussed; this section will focus on functional attributes. Only the fully machine-made cut variety are considered here because only 44 wrought and wire nails were recovered.

Among the cut nails, 131 out of 4,634 (2.83%) are of the "L" headed variety. "L" headed nails are used primarily to secure floorboards. Since the structure at Harford Furnace has been hypothesized to have been of frame construction, the small number of "L" headed nails is not surprising because a frame structure would require many more regular nails than specialized flooring nails.

Only 565 of the recovered nails were complete enough to provide metrical data. The distribution of nail lengths shown in Figure 49 indicates that there are three modes of length. The principal mode is two and a half inches. These nails would probably have secured clapboards and roof shingles. A second mode is five inches. These would have been for light framing and possible interior partitions. The final mode is for spikes greater than six inches in length. These would have been used for the principal framing and tying-in the toes of rafters.

In general, the functional analysis of nails suggests that the building at Harford Furnace was of frame construction secured with three principal sizes of nails. The L-headed cut nails suggest that the building had wooden floors. The small number of very short nails is somewhat surprising as these nails would have secured lath and are generally recovered in large numbers on archeological sites. The excavation recovered slightly less than a kilogram of plaster. This taken with the absence of short nails suggests that the interior of the structure was not plastered. It is possible that the interior was simply white washed (Ridout, personal communication 1987).

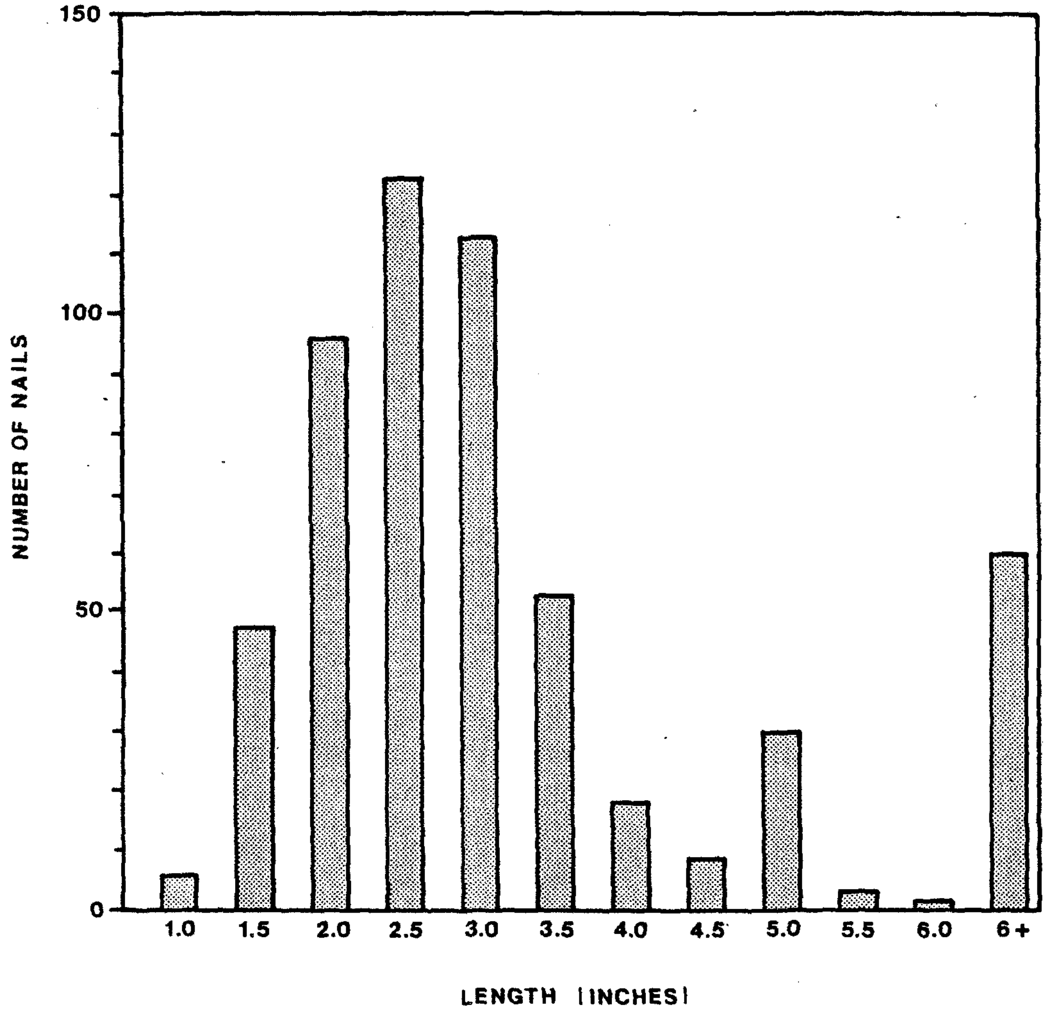


FIGURE 49. Distribution of nail sizes.

APPENDIX V

GLASS VESSELS

by Ronald G. Orr

APPENDIX V
GLASS VESSELS

Tables 31 through 34 summarize the results of the glass vessel description of the material recovered from the Harford Furnace site. The vessels are segregated into four study groups: bottles recovered from around the domestic structure, table vessels recovered from around the domestic structure, bottles recovered from the creek deposit, and table vessels recovered from the creek deposit. Vessel form is described using the standard terms used by collectors and archeologists. Vessel completeness is noted following a modification of the method proposed by Fine (1982): Class "A" vessels are complete from rim to base, Class "B" vessels are represented by rims only, Class "C" vessels are represented by both rim and base which do not mend, Class "D" vessels are represented by basal fragments which cannot be associated with a rim, and Class "E" vessels are unique body fragments not attributable to either a rim or base. Manufacturing techniques are described following the terminology set forth in *The Parks Canada Glass Glossary* (Jones et al. 1985). Temporal and functional interpretations of these data are provided in previous sections of the report.

TABLE 31. Glass bottles from house area.

VESSEL NUMBER	FORM	COLOR	FUNCTION	CLASS	MANUFACTURING TECHNIQUE	DATE
1	PANEL BOTTLE	GREEN	PHARMACEUTICAL	C	MOLD BLOWN	19TH C.
2	PANEL BOTTLE	CLEAR	PATENT MEDICINE	B	MOLD BLOWN, FINISHING TOOL, PATENT LIP	1867-1913
3	BOTTLE	AQUA	PHARMACEUTICAL	B	MOLD BLOWN, FINISHING TOOL, RING LIP	1850-1870
5	PANEL BOTTLE	AQUA	PATENT MEDICINE	C	MOLD BLOWN	1867-1913
6	PANEL BOTTLE	AQUA	PATENT MEDICINE	C	MOLD BLOWN	1867-1913
7	BOTTLE	AQUA	PHARMACEUTICAL	B	2 PC. MOLD, FINISHING TOOL, PATENT LIP	1845-1913
8	BOTTLE	AQUA	PATENT MEDICINE	B	MOLD BLOWN, FINISHING TOOL, PATENT LIP	1867-1913
9	PANEL BOTTLE	AQUA	PATENT MEDICINE	C	MOLD BLOWN	1867-1913
10	PANEL BOTTLE	AQUA	PATENT MEDICINE	B	MOLD BLOWN, MANIPULATION, FLANGED LIP	1867-1880
11	PANEL BOTTLE	AQUA	PATENT MEDICINE	C	MOLD BLOWN, ROUGH PONTIL	1867-1870
12	PANEL BOTTLE	AQUA	PATENT MEDICINE	C	MOLD BLOWN, CHILLED IRON MOLD	c.1870
13	PANEL BOTTLE	AQUA	PATENT MEDICINE	C	IMPROVED PONTIL	1867-1880
14	PANEL BOTTLE	AQUA	PATENT MEDICINE	E	UNKNOWN	1867-1913
15	PANEL BOTTLE	AQUA	PATENT MEDICINE	C	MOLD BLOWN	1867-1913
16	PANEL BOTTLE	AQUA	PATENT MEDICINE	E	MOLD BLOWN	1867-1913
17	PANEL BOTTLE	AQUA	PATENT MEDICINE	C	MOLD BLOWN, ROUGH PONTIL	1867-1870
18	BOTTLE	GREEN	PATENT MEDICINE	B	MOLD BLOWN, MANIPULATION (FOLDED IN.EXT. GROOVED LIP)	1850-1870
19	BOTTLE	AQUA	PATENT MEDICINE	B	MOLD BLOWN, MANIPULATION (DOWN-TOOLED LIP)	1867-1913
20	BOTTLE	AQUA	PATENT MEDICINE	B	MOLD BLOWN, MANIPULATION, FLANGED LIP	1860-1880(?)
21	PANEL BOTTLE	AQUA	PATENT MEDICINE	B	MOLD BLOWN, FINISHING TOOL, PATENT LIP	1860-1870
22	PANEL BOTTLE	GREEN	PATENT MEDICINE	E	MOLD BLOWN	1867-1913
23	PANEL BOTTLE	GREEN	PATENT MEDICINE	E	MOLD BLOWN	1867-1913
24	PANEL BOTTLE	GREEN	PATENT MEDICINE	C	SNAP CASE	1867-1913
25	PANEL BOTTLE	GREEN	PATENT MEDICINE	C	SNAP CASE	1867-1913
26	PANEL BOTTLE	GREEN	PATENT MEDICINE	E	MOLD BLOWN	1878-1901
27	PANEL BOTTLE	AQUA	PATENT MEDICINE	B	MOLD BLOWN, MANIPULATION (FOLDED IN LIP)	1867-1913
28	PANEL BOTTLE	AQUA	PATENT MEDICINE	B	MOLD BLOWN, FINISHING TOOL, PATENT LIP	1867-1913
29	PANEL BOTTLE	GREEN	PATENT MEDICINE	E	SEMI-AUTOMATIC ?	1880-1913(?)
30	PANEL BOTTLE	GREEN	PATENT MEDICINE	E	UNKNOWN	1867-1915
31	PANEL BOTTLE	GREEN	PATENT MEDICINE	E	MOLD BLOWN, DEFECT*	1867-1913
32	PANEL BOTTLE	AQUA	PATENT MEDICINE	C	MOLD BLOWN, SNAP CASE	1867-1913
33	PANEL BOTTLE	GREEN	PATENT MEDICINE	E	MOLD BLOWN?	1867-1913(?)
34	PANEL BOTTLE	AQUA	PATENT MEDICINE	C	MOLD BLOWN, INDENTED BASE	
35	VIAL	GREEN	PHARMACEUTICAL	D	MOLD BLOWN, ROUGH PONTIL	1810-1870
36	VIAL	GREEN	PHARMACEUTICAL	C	MOLD BLOWN, IMPROVED PONTIL	1850-1880
37	VIAL (?)	GREEN	PHARMACEUTICAL	E	MOLD BLOWN, WIDE RIM/DOUBLE FOLD	PRE-1913
38	VIAL	AQUA	PHARMACEUTICAL	C	MOLD BLOWN, SNAP CASE	1865
39	VIAL	GREEN	PHARMACEUTICAL	B	MOLD BLOWN, MANIPULATION (FLANGED LIP)	1820-1920
40	VIAL	GREEN	PHARMACEUTICAL	C	MOLD BLOWN, ROUGH PONTIL	1810-1870
41	VIAL	AQUA	PHARMACEUTICAL	C	MOLD BLOWN, SNAP CASE	1850-1913
42	VIAL	GREEN	PHARMACEUTICAL	C	MOLD BLOWN, SNAP CASE (2PC.)	1850-1913
43	VIAL	AQUA	PHARMACEUTICAL	A	AUTOMATIC BOTTLING MACHINE	1903-
44	VIAL	CLEAR	PHARMACEUTICAL	B	MOLD BLOWN, MANIPULATION (FLANGED LIP)	1820-1920
45	VIAL	AQUA	PHARMACEUTICAL	B	MOLD BLOWN, MANIPULATION (ST.FINISH,FOLDED IN LIP)	1850-1870
46	VIAL	GREEN	PHARMACEUTICAL	C	MOLD BLOWN, 2 PC. MOLD	c.1750-1880
47	VIAL	CLEAR	PHARMACEUTICAL	B	MOLD BLOWN, MANIPULATION (FLANGED LIP)	PRE-1913
48	PANEL BOTTLE	GREEN	PATENT MEDICINE	E	MOLD BLOWN	PRE-1913
49	VIAL	GREEN	PHARMACEUTICAL	C	MOLD BLOWN, ROUGH PONTIL (?)	1810-1870
50	VIAL	GREEN	PHARMACEUTICAL	C	MOLD BLOWN, SNAP CASE (?)	1850-1913
51	VIAL	CLEAR	PHARMACEUTICAL	B	MOLD BLOWN, MANIPULATION (FLANGED LIP)	PRE-1913

TABLE 31 (Continued).

VESSEL NUMBER	FORM	COLOR	FUNCTION	CLASS	MANUFACTURING TECHNIQUE	DATE
52	VIAL	PURPLE	PHARMACEUTICAL	D	MOLD BLOWN	PRE-1913
53	VIAL	GREEN	PHARMACEUTICAL	C	MOLD BLOWN, ROUGH PONTIL	PRE-1870 (?)
54	VIAL(?)	GREEN	PHARMACEUTICAL	B	MOLD BLOWN, FINISHING TOOL, PATENT LIP	PRE-1913
55	PANEL BOTTLE	GREEN	PATENT MEDICINE	C	MOLD BLOWN, SNAP CASE	1867-1913
56	PANEL BOTTLE	GREEN	PATENT MEDICINE	C	MOLD BLOWN, SNAP CASE	1867-1913
57	PANEL BOTTLE	GREEN	PATENT MEDICINE	C	MOLD BLOWN, SNAP CASE	1867-1913
58	PANEL BOTTLE	CLEAR	PATENT MEDICINE	E	UNKNOWN	1867-1915
59	BOTTLE (SQ)	CLEAR	PATENT MEDICINE (?)	E	UNKNOWN	
60	PANEL BOTTLE	GREEN	PATENT MEDICINE	C	MOLD BLOWN, ROUGH PONTIL	1867-1870
61	PANEL BOTTLE	CLEAR	PATENT MEDICINE	E	MOLD BLOWN	1867-1913
62	PANEL BOTTLE	CLEAR	PATENT MEDICINE	C	MACHINE MADE (?)	1913-1915(?)
63	BOTTLE	GREEN	PHARMACEUTICAL	B	MOLD BLOWN, MANIPULATION (PRESCRIPTION LIP/DEFECT)	1840-1870
64	BOTTLE (SQ)	GREEN	PHARMACEUTICAL (?)	E	MOLD BLOWN	1867-1880
65	PANEL BOTTLE	GREEN	PATENT MEDICINE	E	MOLD BLOWN (?)	1867-1915
66	PANEL BOTTLE	GREEN	PATENT MEDICINE	C	MOLD BLOWN, ROUGH PONTIL	1867-1870
67	PANEL BOTTLE	CLEAR	PATENT MEDICINE	E	UNKNOWN	1867-1913
68	PANEL BOTTLE	GREEN	PATENT MEDICINE	E	MOLD BLOWN	1867-1913
69	PANEL BOTTLE	GREEN	PATENT MEDICINE	E	MOLD BLOWN (?)	1867-1915(?)
70	PANEL BOTTLE	GREEN	PATENT MEDICINE	E	MOLD BLOWN OR MACHINE (?)	
71	PANEL BOTTLE	AQUA	PATENT MEDICINE	C	MOLD BLOWN, IMPROVED PONTIL (?)	1867-1880(?)
72	BOTTLE	GREEN	PHARMACEUTICAL	B	MOLD BLOWN, FINISHING TOOL, PATENT LIP	MID-1820s-1913
73	BOTTLE	GREEN	PHARMACEUTICAL	B	MOLD BLOWN, FINISHING TOOL, PRESCRIPTION LIP	1867-1913
74	BOTTLE	GREEN	PHARMACEUTICAL	B	MOLD BLOWN, FINISHING TOOL	1867-1913(?)
75	BOTTLE	GREEN	PHARMACEUTICAL	E	MOLD BLOWN	1860-1913 (?)
76	PANEL BOTTLE	AQUA	PATENT MEDICINE	C	MOLD BLOWN, IMPROVED PONTIL	1867-1880
77	BOTTLE	GREEN	PHARMACEUTICAL	B	MOLD BLOWN, FINISHING TOOL, PATENT LIP	1850-1870 (?)
78	PANEL BOTTLE	GREEN	PATENT MEDICINE	C	MOLD BLOWN, (MOLD SCAR)-2 PC.MOLD	1867-1913
79	PANEL BOTTLE	AQUA	PATENT MEDICINE	C	MOLD BLOWN	1867-1913
80	BOTTLE	GREEN	PHARMACEUTICAL (?)	E	MOLD BLOWN	1860-1913 (?)
81	PANEL BOTTLE	CLEAR	PHARMACEUTICAL	E	MOLD BLOWN	c.1875-1916
82	BOTTLE	GREEN	PHARMACEUTICAL	E	MOLD BLOWN (2 OR 3 PC)	1845(?)-1913
83	BOTTLE	AQUA	PHARMACEUTICAL (?)	E	MOLD BLOWN	1867-1913
84	VIAL	AQUA	PHARMACEUTICAL	C	MOLD BLOWN	PRE-1913
85	PANEL BOTTLE	MANGANESE TINTED	PHARMACEUTICAL	C	MOLD BLOWN	c.1875-1916
86	PANEL BOTTLE	GREEN	PATENT MEDICINE	C	MOLD BLOWN, SNAP CASE (?)	1867-1913
87	PANEL BOTTLE	MANGANESE TINTED	PHARMACEUTICAL (?)	E	MOLD BLOWN	c.1875-1916
88	PANEL BOTTLE	CLEAR	PHARMACEUTICAL (?)	E	MOLD BLOWN	1867-1913(?)
89	PANEL BOTTLE	GREEN	PATENT MEDICINE	E	MOLD BLOWN	1867-1913
90	BOTTLE	CLEAR	PHARMACEUTICAL	E	MOLD BLOWN	PRE-1913
91	PANEL BOTTLE	CLEAR	PHARMACEUTICAL	E	MOLD BLOWN	1867-1913
92	PANEL BOTTLE	GREEN	PATENT MEDICINE	C	MOLD BLOWN, IMPROVED PONTIL	1867-1880
93	BOTTLE	AQUA	PHARMACEUTICAL (?)	B	MOLD BLOWN, FINISHING TOOL, PATENT LIP	1850-1870
94	PANEL BOTTLE	AQUA	PHARMACEUTICAL	E	MOLD BLOWN	1867-1913
95	PANEL BOTTLE	CLEAR	PHARMACEUTICAL	E	MOLD BLOWN	1867-1913
96	PANEL BOTTLE	AQUA	PHARMACEUTICAL	E	MOLD BLOWN	1867-1913
97	PANEL BOTTLE	GREEN	PATENT MEDICINE	B	MOLD BLOWN, MANIPULATION (DOWN-TOOLED LIP)	PRE-1913
99	BOTTLE (RD)	GREEN	PHARMACEUTICAL	E	MOLD BLOWN	
100	BOTTLE (RD)	AQUA	PHARMACEUTICAL	C	MOLD BLOWN	
101	PANEL BOTTLE	AQUA	PATENT MEDICINE (?)	E	MOLD BLOWN	1867-1913(?)

TABLE 31 (Continued).

VESSEL NUMBER	FORM	COLOR	FUNCTION	CLASS	MANUFACTURING TECHNIQUE	DATE
102	BOTTLE	CLEAR	PHARMACEUTICAL	B	MOLD BLOWN, FINISHING TOOL, PRESCRIPTION LIP	1850-1870
103	JAR	CLEAR	PHARMACEUTICAL (?)	B	MOLD BLOWN, MANIPULATION	1830-1880(?)
104	BOTTLE	AQUA	PHARMACEUTICAL	B	MOLD BLOWN, MANIPULATION (DOWN-TOOLED LIP)	1850-1870
105	BOTTLE	MANGANESE TINTED	PHARMACEUTICAL (?)	E	MOLD BLOWN	c.1875-1916
109	VIAL (?)	CLEAR	UNKNOWN	B	AUTOMATIC BOTTLING MACHINE	1903+ (?)
110	BOTTLE (RD)	AQUA	LIQOUR (?)	C	AUTOMATIC BOTTLING MACHINE	1920-
111	BOTTLE	AQUA	UNKNOWN	B	MOLD BLOWN, APPLIED LIP	1850-1870
112	BOTTLE (RD)	AQUA	LIQUOR, SODA (?)	C	MOLD BLOWN, CHILLED IRON MOLD	1870-
113	JAR (?)	AQUA	STORAGE	B	MOLD BLOWN, MANIPULATION (FLAT SIDE, FOLDED OUT LIP)	1850-1870
114	BOTTLE (RD)	BLUE	PHARMACEUTICAL	C	AUTOMATIC BOTTLING MACHINE	1920-
114	BOTTLE (RD)	BLUE	PHARMACEUTICAL	C	AUTOMATIC BOTTLING MACHINE	1920-
115	BOTTLE	AQUA	INK, 9 PANELS	E	MOLD BLOWN, CHILLED IRON MOLD	10/31,1865
116	BOTTLE (RD)	AQUA	LIQUOR, SODA?	C	MOLD BLOWN, CHILLED IRON MOLD	1870-
118	BOTTLE (RD)	AQUA	LIQUOR(?), SODA (?)	E	MOLD BLOWN	1870-
119	BOTTLE (RD)	AQUABLUE	SODA(?)	C	AUTOMATIC BOTTLING MACHINE	1903-
120	BOTTLE (RD)	AQUA	LIQUOR(?),SODA(?)	C	UNKNOWN	
121	JAR	AQUA	STORAGE	B	MOLD BLOWN, MANIPULATION	1850-1870
122	JAR	AQUA	STORAGE	B	MOLD BLOWN, FINISHING TOOL, ROUNDED LIP	1850-1870
123	LID	AQUA	STORAGE	B	AUTOMATIC BOTTLING MACHINE	1903-
124	JAR LID	AQUA	STORAGE	B	PRESSED GLASS(?)	1869
125	BOTTLE (RD)	GREEN	LIQUOR	C	PUSH-UP	1810-1880(?)
126	BOTTLE (RD)	GREEN	LIQUOR(?)	E	3 PC. HINGE MOLD	1822-1890
127	BOTTLE (RD)	GREEN	LIQUOR (WINE)	E	MOLD BLOWN, CHILLED IRON MOLD	c.1870
128	BOTTLE (RD)	GREEN	WINE	A	MOLD BLOWN, APPLIED LIP, IMPROV.PONTIL	1855-1870
129	BOTTLE (RD)	GREEN	LIQUOR	C	MOLD BLOWN, DEEP PUSH UP	1840-1880(?)
130	BOTTLE (RD)	GREEN	WINE	E	MOLD BLOWN	PRE-1913
132	BOTTLE (RD)	GREEN	LIQUOR	B	MOLD BLOWN, FINISHING TOOL, ROUNDED LIP	1850-1870
133	BOTTLE (RD)	GREEN	LIQUOR(?)	C	MOLD BLOWN	
134	BOTTLE (RD)	GREEN	LIQUOR	C	MOLD BLOWN, ROUGH PONTIL	1810-1870
135	BOTTLE (SQ)	GREEN	LIQUOR	E	MOLD BLOWN	PRE-1870
136	BOTTLE (RD)	GREEN	LIQUOR	C	MOLD BLOWN; SNAP CASE(?)	1855-1913(?)
137	BOTTLE	AQUA	LIQUOR(?)	E	MOLD BLOWN	
139	BOTTLE	AMBER	LIQUOR?)	E	MOLD BLOWN, EMBOSSED PANEL	1867-1913
141	BOTTLE FLASK	AMBER	LIQUOR	E	MOLD BLOWN	1860s
142	PANEL BOTTLE	AMBER	PHARMACEUTICAL	C	MOLD BLOWN, 2 PC. MOLD	c.1857-1880
143	BOTTLE	AMBER	BEER	E	MOLD BLOWN	
144	PANEL BOTTLE	AMBER	PHARMACEUTICAL (?)	E	MOLD BLOWN	1862
145	BOTTLE	AMBER	BEER	C	AUTOMATIC BOTTLING MACHINE	1920
146	BOTTLE	AMBER	LIQUOR	E	MOLD BLOWN, 2 PC. MOLD	c.1750-1880
147	BOTTLE	AMBER	LIQUOR	E	MOLD BLOWN	
148	FLASK	AMBER	LIQUOR	E	UNKNOWN	
150	BOTTLE	AMBER	BEER	B	MOLD BLOWN, MANIPULATION	c.1880
151	BOTTLE	AMBER	BEER	E	MOLD BLOWN, MACHINE APPLIED LIP	c.1895
152	BOTTLE	AMBER	BEER	C	AUTOMATIC BOTTLING MACHINE	1903-
153	BOTTLE (RD)	CLEAR	LIQUOR	C	MOLD BLOWN	PRE-1913
154	BOTTLE	CLEAR	UNKNOWN	B	MOLD BLOWN, FINISHING TOOL	MID-1820s-1913
155	BOTTLE	CLEAR	MILK(?)	B	APPLIED LIP(?)	1850-1870
156	BOTTLE	GREEN	UNKNOWN	B	MOLD BLOWN, MANIPULATION (ST.FINISH,FOLDED IN LIP)	PRE-1913
157	BOTTLE	CLEAR	UNKNOWN	B	MACHINE MADE (?)	1903(?)

TABLE 31 (Continued).

VESSEL NUMBER	FORM	COLOR	FUNCTION	CLASS	MANUFACTURING TECHNIQUE	DATE
158	BOTTLE	CLEAR	MILK(?)	B	SEMI-AUTOMATIC(?), MANIPULATION (ST. FINISH, FOLDED IN LIP)	1881 (?)-
162	JAR	CLEAR	PHARMACEUTICAL (?)	B	MOLD BLOWN, FINISHING TOOL, SILVERING (?)	1848 (?) - 1869 (?)
163	BOTTLE	MANGANESE TINTED	UNKNOWN	E	MACHINE MADE (?)	1880-1916
164	BOTTLE	BLUE	UNKNOWN	E	AUTOMATIC BOTTLING MACHINE	1903-
190	JAR LID (?)	CLEAR	UNKNOWN	B	PRESSED GLASS	1827-
193	BOWL(?)	CLEAR	UNKNOWN	B	PRESSED GLASS	
210	CONTAINER	TRANSPARENT	UNKNOWN	E	PRESSED GLASS	1827-
214	PANEL BOTTLE	AQUA	PATENT MEDICINE	E	MOLD BLOWN	1867-1913
215	PANEL BOTTLE	GREEN	PATENT MEDICINE	E	MOLD BLOWN	1867-1913
216	PANEL BOTTLE	AQUA	PHARMACEUTICAL	C	MOLD BLOWN (POSS. PUSH-UP?)	1867- (?)
217	PANEL BOTTLE	GREEN	PATENT MEDICINE	E	UNKNOWN	1867-1915
218	PANEL BOTTLE	GREEN	PATENT MEDICINE	E	MOLD BLOWN	1867-1913
219	PANEL BOTTLE	CLEAR	PATENT MEDICINE	E	MOLD BLOWN	1867-1913
220	PANEL BOTTLE	GREEN	PATENT MEDICINE	E	MOLD BLOWN	1867-1913
222	BOTTLE (SQ)	CLEAR	PHARMACEUTICAL (?)	E	UNKNOWN	
223	BOTTLE	GREEN	PHARMACEUTICAL (?)	E	MOLD BLOWN (?)	
224	BOTTLE	CLEAR	PHARMACEUTICAL (?)	E	MOLD BLOWN	PRE-1913
225	BOTTLE	AQUA	UNKNOWN	E	MOLD BLOWN	
226	BOTTLE	AQUA	UNKNOWN	E	MOLD BLOWN (?)	
227	PANEL BOTTLE	CLEAR	PHARMACEUTICAL (?)	E	MOLD BLOWN	1867-1913
228	BOTTLE (SQ)	CLEAR GREEN TINT	PHARMACEUTICAL	C	MOLD BLOWN, ROUGH PONTIL	1867-1870(?)
229	BOTTLE (RD)	AQUA	UNKNOWN	E	UNKNOWN	1860-1915
231	PANEL BOTTLE	GREEN	PATENT MEDICINE	E	MOLD BLOWN	1867-1913
233	BOTTLE (RD)	AQUA	UNKNOWN	C	MOLD BLOWN, IMPROVED PONTIL	1840-1880
234	VIAL	BLUE	PHARMACEUTICAL	B	MOLD BLOWN, APPLIED LIP	LATE 19TH,EARLY 20TH C.
235	BOTTLE	AQUA	PHARMACEUTICAL (?)	E	MOLD BLOWN	1860-1913
238	PANEL BOTTLE (?)	AQUA	PHARMACEUTICAL (?)	C	MOLD BLOWN, IMPROVED PONTIL	1840-1880
241	VIAL	CLEAR	UNKNOWN	E	MOLD BLOWN	PRE-1913
242	PANEL BOTTLE	CLEAR	PATENT MEDICINE	E	MOLD BLOWN	1867-1913
244	BOTTLE	GREEN	PHARMACEUTICAL	B	MOLD BLOWN; MANIPULATION(FLANGED LIP),WIDE PRESCRIPTION LIP	1850-1870
245	PANEL BOTTLE	GREEN	PATENT MEDICINE	B	MOLD BLOWN, FINISHING TOOL, PATENT LIP	1881-1913
246	PANEL BOTTLE	GREEN	PATENT MEDICINE	C	MOLD BLOWN	1867-1913
247	BOTTLE	GREEN	PHARMACEUTICAL	B	MOLD BLOWN, FINISHING TOOL, PATENT LIP	1850-1870
248	PANEL BOTTLE	GREEN	PATENT MEDICINE	E	MOLD BLOWN	1867-1913
249	PANEL BOTTLE	GREEN	PATENT MEDICINE	C	MOLD BLOWN, IMPROVED PONTIL	1867-1880
250	BOTTLE	GREEN	PHARMACEUTICAL (?)	B	MOLD BLOWN, FLAT LIP ("DEEP LIP")	1880 (?)
251	PANEL BOTTLE	GREEN	PATENT MEDICINE	E	MOLD BLOWN	1867-1913
252	VIAL	GREEN	PHARMACEUTICAL	C	MOLD BLOWN.. ROUGH PONTIL	1867-1870
253	BOTTLE	AQUA	UNKNOWN	E	MOLD BLOWN	
254	BOTTLE	CLEAR	MUSTARD	E	MOLD BLOWN, FLAT PANELS	c.1800-c.1900
255	BOTTLE (SM)	CLEAR	PHARMACEUTICAL	C	2 PC. MOLD	PRE-1913
256	PANEL BOTTLE	GREEN	PATENT MEDICINE	E	MOLD BLOWN (?)	1867-1913
257	BOTTLE	GREEN	PHARMACEUTICAL	B	MOLD BLOWN, FINISHING TOOL, PATENT LIP	1867-1913
258	BOTTLE	GREEN	PHARMACEUTICAL	B	MOLD BLOWN, FINISHING TOOL, PATENT LIP	1867-1913
259	PANEL BOTTLE	GREEN	PATENT MEDICINE	B	MOLD BLOWN, FINISHING TOOL, PATENT LIP	1867-1870
260	PANEL BOTTLE	GREEN	PATENT MEDICINE	B	MOLD BLOWN, FINISHING TOOL, DOUBLE RING LIP	1867-1913
261	BOTTLE	GREEN	PHARMACEUTICAL	B	MOLD BLOWN, FINISHING TOOL, PATENT LIP	1867-1913
262	PANEL BOTTLE	GREEN	PATENT MEDICINE	B	MOLD BLOWN	1867-1913
263	PANEL BOTTLE	GREEN	PATENT MEDICINE	B	MOLD BLOWN, FINISHING TOOL, DOUBLE RING	1867-1913

TABLE 31 (Continued).

VESSEL NUMBER	FORM	COLOR	FUNCTION	CLASS	MANUFACTURING TECHNIQUE	DATE
264	PANEL BOTTLE	AQUA	PATENT MEDICINE	C	MOLD BLOWN	1867-1913
265	BOTTLE	GREEN	PHARMACEUTICAL	B	MOLD BLOWN, WIDE MOUTH, MANIPULATION (ST.FINISH,FOLDED IN LIP)	1840-1870
266	VIAL (FLAT)	AQUA	PHARMACEUTICAL	C	MOLD BLOWN	PRE-1913
272	BOTTLE	CLEAR	UNKNOWN	C	FREE BLOWN, ROUGH PONTIL	1700-1870
274	BOTTLE	AMBER	LIQUOR?	B	MOLD BLOWN, FINISHING TOOL, DOUBLE RING	1850-1870
275	BOTTLE	AMBER	BEER	C	AUTOMATIC BOTTLING MACHINE	1903
276	BOTTLE	AMBER	LIQUOR(?)	B	MOLD BLOWN, MANIPULATION (DOWN-TOOLED ?)	1850-1870
277	BOTTLE	AMBER	LIQUOR(?)	B	MOLD BLOWN, FINISHING TOOL, DOUBLE RING	c.1750-18[illegible]
280	BOTTLE	GREEN	UNKNOWN	E	MOLD BLOWN	
282	VIAL	AQUA	PHARMACEUTICAL	C	MOLD BLOWN, ROUGH PONTIL	1810-1870

TABLE 32. Table glass vessels from house area.

VESSEL NUMBER	FORM	COLOR	CLASS	MANUFACTURING TECHNIQUE	DECORATION	DATE
140	TUMBLER (?)	AMBER	E	PATTERN MOLDING	CORRUGATED (EXT. AND INT.)	1756-1913
159	GLASS	CLEAR	B	AUTOMATIC (?) MACHINE MADE	MOLD LINE IMPERFECTION	1903
166	STOPPER	TRANSLUCENT	E	MOLD BLOWN , SHEARED, GROUND SMOOTH		PRE-1913
167	HANDLE	CLEAR	E	MOLD BLOWN, HAND FINISHED HANDLE		PRE-1913
168	GLASS	CLEAR	B	AUTOMATIC BOTTLING MACHINE		1903
169	GLASS	CLEAR (CLOUDED)	B	UNCERTAIN -MOLD OR MACHINE(?)		
170	TUMBLER	CLEAR	B	PRESSED GLASS	MOLDED ARCHES .75" FROM RIM	1827-
171	GLASS	TRANSLUCENT	B	MOLD BLOWN	MOLDED ARCHES, VERTICAL RIBS	1880
172	STEMMED GLASS	CLEAR	B	UNCERTAIN		
173	HOLLOW GLASS	CLEAR	B	UNCERTAIN		
175	GLASS	CLEAR	B	UNCERTAIN		1903-
176	GLASS	CLEAR	B	PRESSED GLASS	ARCHED INDENTATION BELOW RIM	1827- (?)
177	GLASS	CLEAR	B	UNCERTAIN	INDENTED ARCHES AND VERTICAL RIBS	
178	TUMBLER	CLEAR	C	MOLD BLOWN	POLYGONAL	
180	GLASS (SQ)	CLEAR	C	MOLD BLOWN	PANELED SIDES, OCTAGONAL BASE	PRE-1913
181	TUMBLER	MANGANESE TINTED	D	MACHINE MADE (?)	POLYGONAL BASE	1903-
182	GLASS	CLEAR	B	MOLD BLOWN		PRE-1913
183	TUMBLER	CLEAR	C	PRESSED(?)		1827(?)-
184	TUMBLER	MANGANESE TINTED	C	MOLD BLOWN, IMPROVED PONTIL (?)	SEPTAGONAL THICK BASE	c.1875-1916
185	TUMBLER	CLEAR	C	MOLD BLOWN		
186	TUMBLER(?)	CLEAR	B	UNCERTAIN		
188	GLASS	CLEAR	B	MACHINE MADE		1903-
191	STEMMED GLASS	CLEAR	C	FREE BLOWN		
194	CUP HANDLE	CLEAR	E	FREE BLOWN	2 PARALLEL INDENTS	
196	BOWL	TRANSPARENT/PINK	B	PRESSED GLASS	FLORAL WITH SERRATED LEAVES	1827-
197	BOWL(?)	CLEAR	B	PRESSED GLASS	BEADED RIM, VERT.,STRIPED DESIGN	1827-
198	GLASS	CLEAR	E	PRESSED GLASS	INTERIOR PARALLEL BANDS	1827-
199	JAR LID (?)	MANGANESE TINTED	B	PRESSED GLASS	SUNBURST/FLOWER PETAL DESIGN	c.1875-1916
201	DISH	CLEAR	B	PRESSED GLASS	VERT., PARALLEL RIDGES;WAVY LIP	1827-
202	BOX LID (?)	MILK GLASS	E	PRESSED GLASS	DOME SHAPE ON FLAT SURFACE	1827-
203	BOWL(?)	CLEAR	E	PRESSED GLASS	GEOMETRIC DESIGN	1827-
204	UNKNOWN	CLEAR	E	PRESSED GLASS	SUNBURST INSIDE DIAMOND; BEADED CIRCULAR SHAPES	1827-
205	CONTAINER	CLEAR	E	PRESSED GLASS	VERT., PARALLEL LINES ON EXTERIOR	1827-
206	CONTAINER	CLEAR	C	PRESSED GLASS	RASPBERRY-TYPE DESIGN;PARALLEL,VERT. RIDGES (EXT.)	1827(?)
207	DISH (OVAL)	CLEAR	C	PRESSED GLASS	LEAVES AND GRAPES ON STIPPLED (?) SURFACE (EXT.)	1827-1850
208	BOWL	CLEAR	B	PRESSED GLASS	IMPRESSED GRID DESIGN IN PETAL SHAPES (EXT.)	1827-
209	BOWL	CLEAR	B	PRESSED GLASS	CROSS HATCH (SPACED) ON INTERIOR	1827-
211	BOWL(?)	CLEAR	E	PRESSED GLASS	CLOSELY -PACKED PYRAMID SHAPES	1827-
212	DISH (?)	COBALT BLUE	E	PRESSED GLASS	MOLDED FISH DESIGN (SMALL SCALES)	1827-
213	DISH(?)	MILK GLASS	E	PRESSED GLASS (?)		1827-
221	BOWL	CLEAR	E	DARK, SILVER LEAF PRESSED INSIDE	SILVERIA	
230	BOTTLE	CLEAR	E	PRESSED GLASS	INDENTED ROPE DESIGN (FRAGMENTED)	1827-
232	PLATE(?)	CLEAR	E	PRESSED GLASS	HATCHED LINES (INCISED APPEARANCE)	1827-
236	PLATE(?)	CLEAR	E	PRESSED GLASS	CHECKERED PATTERN	1827-
237	GLASS	AQUA	B	MOLD BLOWN, FINISHING TOOL, PATENT LIP	BULGING RIM, PLANED SURFACES	EARLY 20TH C.
239	WINE GLASS	CLEAR	B	MOLD BLOWN, THIN GLASS		PRE-1913
240	GLASS	CLEAR	B	MOLD BLOWN (?)		
243	GLASS	CLEAR	E	PRESSED GLASS	CORRUGATED BODY (VERTICAL LINES)	
267	TUMBLER	FROSTED	C	MOLD BLOWN, ROUGH PONTIL		1810-1870
268	CUP HANDLE(?)	CLEAR	E	FREEBLOWN		
269	PITCHER HANDLE(?)	CLEAR	E	FREEBLOWN		
270	BOWL	CLEAR	E	PRESSED GLASS	CROSS HATCHED	1827-
271	HOLLOW	CLEAR	E	PRESSED GLASS	PARALLEL MOUNDED LINES	1827
273	GLASS	CLEAR	B	MOLD BLOWN, FINISHING TOOL, PROTRUDING EDGE LIP		PRE-1913
278	TUMBLER	CLEAR	E	PRESSED GLASS	MOLDED INTERCONNECTING TEARDROPS	1827-

TABLE 33. Glass bottles from creek deposit.

VESSEL NUMBER	FORM	COLOR	FUNCTION	CLASS	MANUFACTURING TECHNIQUE	DECORATION	DATE
4	PANEL BOTTLE	CLEAR	PHARMACEUTICAL	E	MOLD BLOWN		PRE-1913
98	VIAL (?)	CLEAR	PHARMACEUTICAL	E	MOLD BLOWN	BEVELED EDGES	PRE-1913
106	BOTTLE (RECT)	CLEAR	BITTERS	C	PATTERN MOLDED (2 PC)	FIR TREE	c.1750-1880
107	BOTTLE (SQ)	AQUA	MUSTARD	C	MOLD BLOWN (2 PC), ROUGH PONTIL	CHAMFERED CORNERS	c.1800-1900
108	BOTTLE	AQUA	MUSTARD	C	MOLD BLOWN (2 PC), ROUGH PONTIL	CHAMFERED CORNERS	c.1800-1900
131	BOTTLE (RD)	GREEN	LIQUOR	C	FREEBLOWN, ROUGH PONTIL		1810-1870
138	BOTTLE (RD)	AMBER	LIQUOR	E	MOLD BLOWN		PRE-1913
149	FLASK	AMBER	LIQUOR	E	MOLD BLOWN, PATTERN MOLDED	BEN FRANKLIN'S FACE	1825-1837
160	JAR(?)	CLEAR	PICKLE(?)	B	MOLD BLOWN, MANIPULATION		PRE-1913
161	JAR(?)	CLEAR	UNKNOWN	B	MOLD BLOWN, FIRE POLISHED RIM		PRE-1913
279	CONTAINER (RD)	CLEAR	UNKNOWN	B	MOLD BLOWN		PRE-1913
281	BOTTLE (SQ)	CLEAR	PHARMACEUTICAL	E	MOLD BLOWN	EMBOSSED	PRE-1913

TABLE 34. Table glass vessels from creek deposit.

VESSEL NUMBER	FORM	COLOR	FUNCTION	CLASS	MANUFACTURING TECHNIQUE	DECORATION	DATE
165	STEMMED GLASS	CLEAR	TABLE	E	MOLD OR FREE BLOWN(?)	BULBOUS STEM	PRE-1913
187	TUMBLER	CLEAR	TABLE	C	MOLD BLOWN, ROUGH PONTIL		1810-1870
192	WINE CARAFE?	CLEAR	TABLE	B	MOLD BLOWN, MANIPULATION	BULBOUS RIM, FOLDED LIP	PRE-1913
195	CUP HANDLE	CLEAR	TABLE	E	FREE BLOWN		
200	BOWL OR LID	CLEAR	TABLE	E	PRESSED GLASS	CURVING SHAPES	1827-(?)

APPENDIX VI

FOOTWEAR FROM HARFORD FURNACE

by D. Albert Saguto

APPENDIX VI
FOOTWEAR FROM HARFORD FURNACE

The following footwear and footwear fragments were examined by the author on 8 July 1987, for the Maryland Geological Survey, Division of Archeology.

The footwear artifacts recovered from this site are from two features: the larger quantity excavated from a relict creek bed, which was well preserved in the wet environment; and a very few brittle fragments from the "slag road," representing at most one pair of shoes.

All data were collected from the footwear while still moist. The condition was noted as very supple, and relatively good. Virtually all traces of thread had perished, and only the wooden pegs and copper alloy nails used to attach the outsoles of several specimens remained *in situ*.

The illustrations of the artifacts were done from full-size tracings, and measured drawings. These are conjectural reconstructions, showing missing features in broken line and are transparent in that inside features are shown in faint solid line, whereas outside details are drawn in heavy solid line.

The objects have been broken down into categories according to style, where discernible: Brogans, Tie Shoes, Wellington Boots, Identifiable Fragments, Unidentifiable Fragments, and Fragments from the Slag Road (Table 35, Figures 50 through 55) (see glossary which follows for definitions).

Since the excavated footwear is reported to have come from only a 4 cubic meter sample, this is nothing more than a sample of the footwear deposited on the area of the site excavated.

The smallest group of artifacts are those from the "slag road," which can be described as several small leather fragments surrounding copper alloy eyelets, one of which exhibits possible machine stitching across one end. Metal eyelets were first patented in ca. 1823, and the first sewing machines in the 1850s. These fragments could be from a female's high, laced boot of the late 19th century, or from a male's shoe of the same period through the present day. Judging by the condition and location, the earliest possible date to ascribe to the "slag road" fragments would be the early second half of the 19th century, but they could be much later.

The largest portion of footwear from this site was from the relict creek bed. This material represents male footwear, mostly adult, with several youth's size shoes. The styles are largely the common, working class, leather "Brogans" (ankle-high shoes), and heavily-made "Latchet Tie" shoes. The constructions (method of sole attachment) include "welted," "pegged," "nailed" or "riveted," and one possible "channeled" shoe. All of the sewing was hand-done. These constructions, especially when nearly equally represented, suggest footwear from several sources, not locally-made by the same manufacturer. Hand-sewn "welted" construction is dominant in American footwear from the 17th century to the 1820s, when experiments with more rapid, less expensive, methods such as "pegging" with wood begin to emerge in large numbers. "Nailing" or "riveting" also was tried in the early 19th century, but is considered a more common feature on British shoes, whereas "pegging" with wood predominates in the United States. By the 1840s and 1850s "pegging" had almost

TABLE 35. Footwear recovered from Harford Iron Furnace sites.

A. From the relict creek bed.

Brogans:

18HA148/520.1 (#4) Youth's, welted, outside counter (I) (Figure 50)
18HA148/539.1 Man's, inside stiffener (I) (Figure 51)
18HA148/697.1 (#5) Man's, pegged, back-strap (I) (Figure 52)
18HA148/534.1 Man's, (quarter tab only) (not illustrated)
18HA148/534.2 Man's, (fragments only) (not illustrated)

Tie Shoes:

18HA148/520.2 A/B (#3, #9), Pair youth's, welted, inserted stiffener (I) (Figure 53)
18HA148/540.1 (#13) Man's, welted, inside stiffener (I) (Figure 54)
18HA148/520.3 (#11) Man's, single row brass nailed, salvaged quarters (I) (Figure 55)
18HA148/967.2 (#6) Man's, welted (not illustrated)
18HA148/534.3 (#14) Man's, double row pegged, blind rand in seat (not illustrated)

Wellington Boots:

18HA148/520.4 (#10, #1 toe fragment) Man's, brass nailed (not illustrated)
18HA148/527.1 Fragments only (not illustrated)
18HA148/540.2 Man's, double row pegged, leg salvaged (not illustrated)

Identifiable Footwear Fragments:

18HA148/520.5 (#12) Youth's, welted, sole and bottom fragments (not illustrated)
18HA148/538.1 (#16) Man's, channel-shoe (?) outsole fragments (not illustrated)
18HA148/533.1 Man's, double row pegged, includes sole off-cut (not illustrated)
18HA148/527.2 (#7) Man's, double row pegged, outsole fragments (not illustrated)
18HA148/527.2 Youth's, welted insole (not illustrated)

Unidentifiable Footwear Fragments:

18HA148/518	(not illustrated)
532	(not illustrated)
572	(not illustrated)
525	(not illustrated)
526.1	(not illustrated)
526.2	(not illustrated)
517	(not illustrated)
531	(not illustrated)

B. From slag road.

18HA148/314.1 Female (?), lace tab fragments with brass eyelets (not illustrated)
18HA148/345.1 Female (?), lace tab fragments with brass eyelets (not illustrated)
18HA148/301.1 Female (?), lace tab fragments with brass eyelets (not illustrated)

(Minimum footwear count: 20 singles, plus one pair)

18HA148/520.1 (#4): Youth's Brogan, made welted, blind rand in seat. Uppers 4oz. flesh. Three pairs of lace holes, one pair in tongue. Pieced tongue (missing), stabbed to vamp tongue. Side seams stabbed; outside curved counter stabbed. Three lift stacked leather heel (badly worn); single row pegged in top lift. Made straight - worn right.

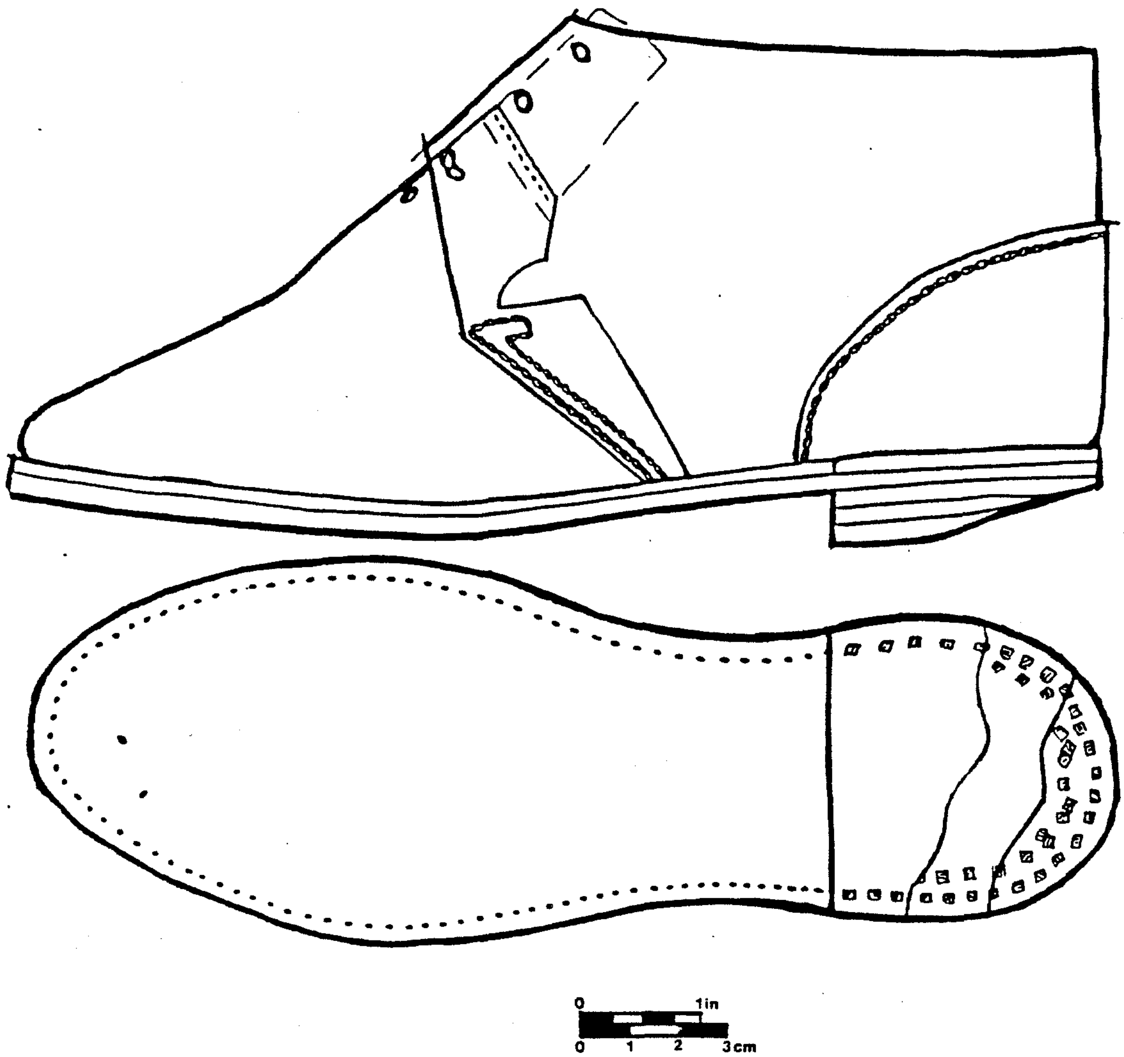


FIGURE 50. Specimen 18HA148/520.1. Youth's brogan.

18HA148/539.1: Man's Brogan uppers fragments, 6oz. flesh. Three pairs of lace holes, one pair in tongue. Pieced tongue (missing), whip-stitched to vamp tongue inside. Side seams round-closed outside, stabbed at base of tab. Inside curved heel stiffener (missing) stabbed. [In association with a single row pegged outsole and split lift].

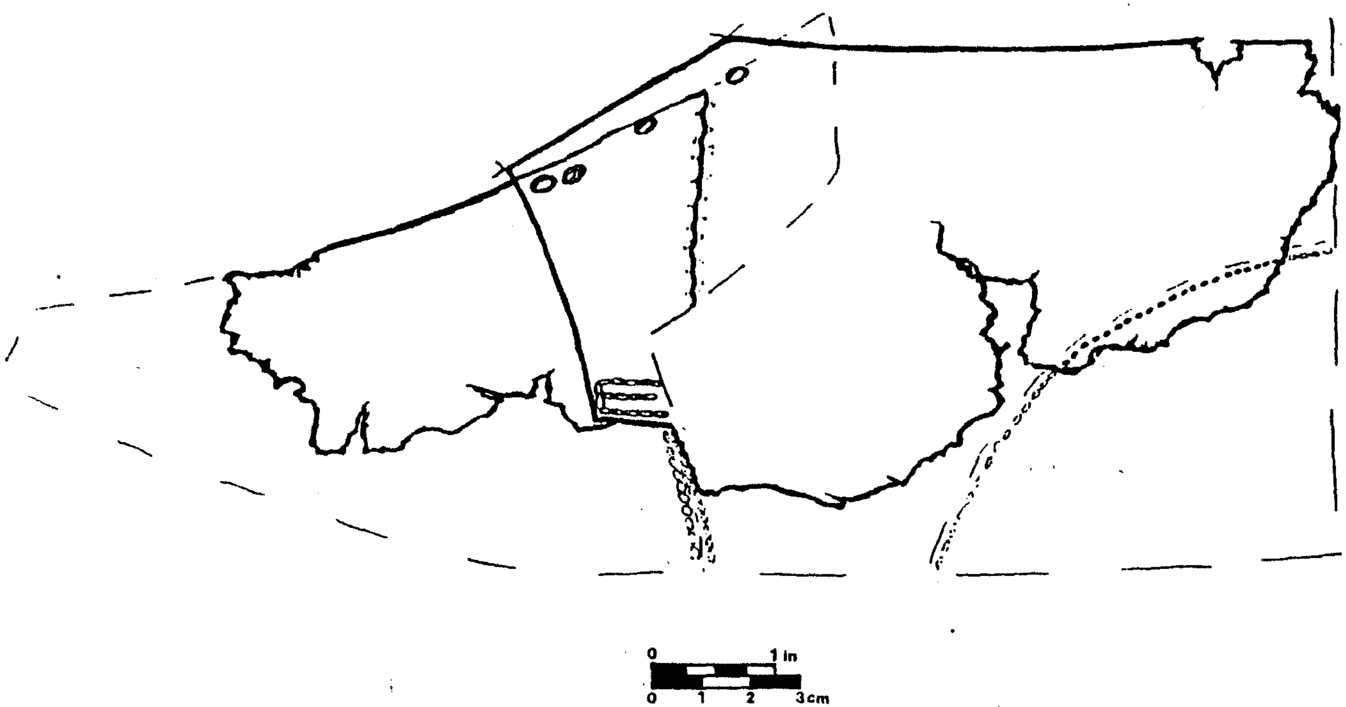


FIGURE 51. Specimen 18HA148/539.1. Man's brogan upper fragments.

18HA148/697.1 (#5): Man's Brogan, made double row pegged, with false welt all around. Uppers 5 1/2 oz. flesh. Two pairs of lace holes, one pair in vamp center. Vamp side linings taken into stabbed side seams. Heel seam round-closed outside, repair backstrap (missing) stabbed over heel seam. Heel repaired with a single row of very stout pegs. Made straight - worn left.

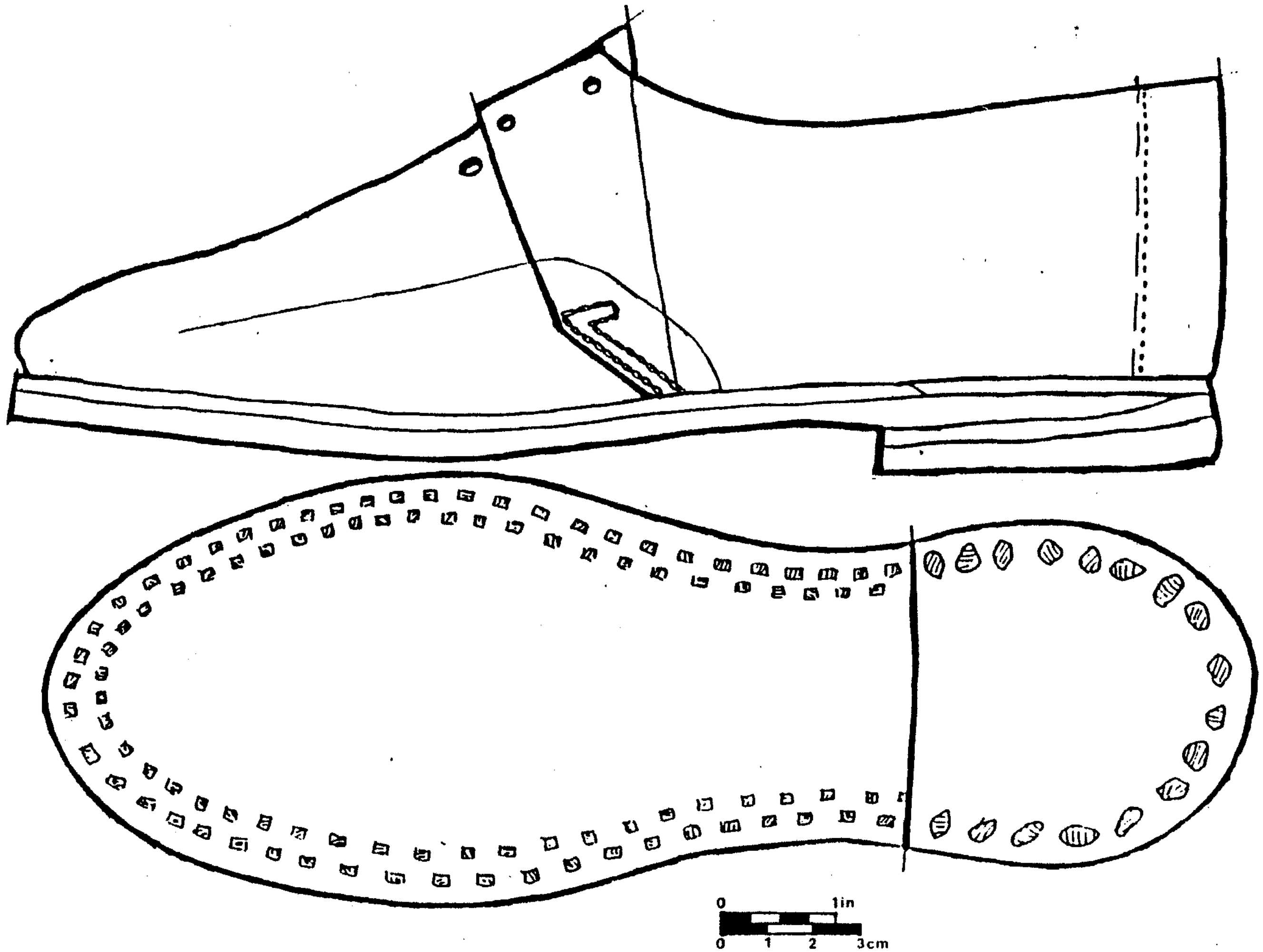


FIGURE 52. Specimen 18HA148/697.1. Man's brogan.

18HA148/520.2 A/B (#3,#9): Pair Youth's Tie Shoes, made welted, blind rand in seat. Uppers 3 1/2 oz. flesh. Tongue and top edge bound or corded (missing). Two pairs of lace holes. Vamp lined with linen cloth; quarters lined with leather; inserted heel stiffener. Side seams stabbed and turned inside, stabbed at base of tab; heel seam stabbed and turned inside. Half-sole repair sewn to welt, grafted under old sole at waist with pegs. Heel sewn around, with single row of pegs across breast. Hole cut-out over great toe. Made straight - worn rights and lefts.

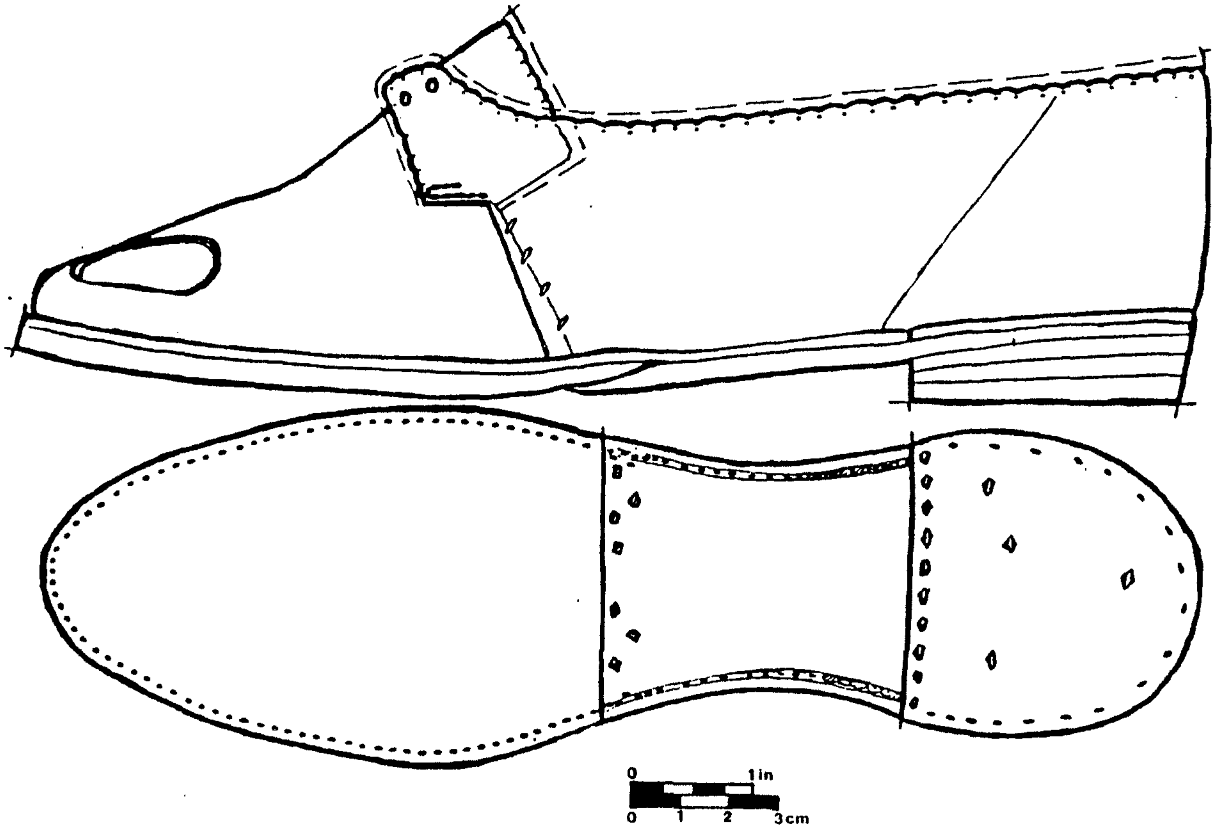


FIGURE 53. Specimen 18HA148/520.2. A/B Pair youth's tie shoes.

18HA148/540.1 (#13): Man's Tie Shoe, made welted, blind rand in seat. Uppers 6 oz. flesh. Two pairs of lace holes. Curved inside stiffener whip-stitched. Side seams round-closed outside, stabbed at base of tab; heel seam round-closed outside. Single row of pegs across heel (missing) breast. Made straight - worn left.

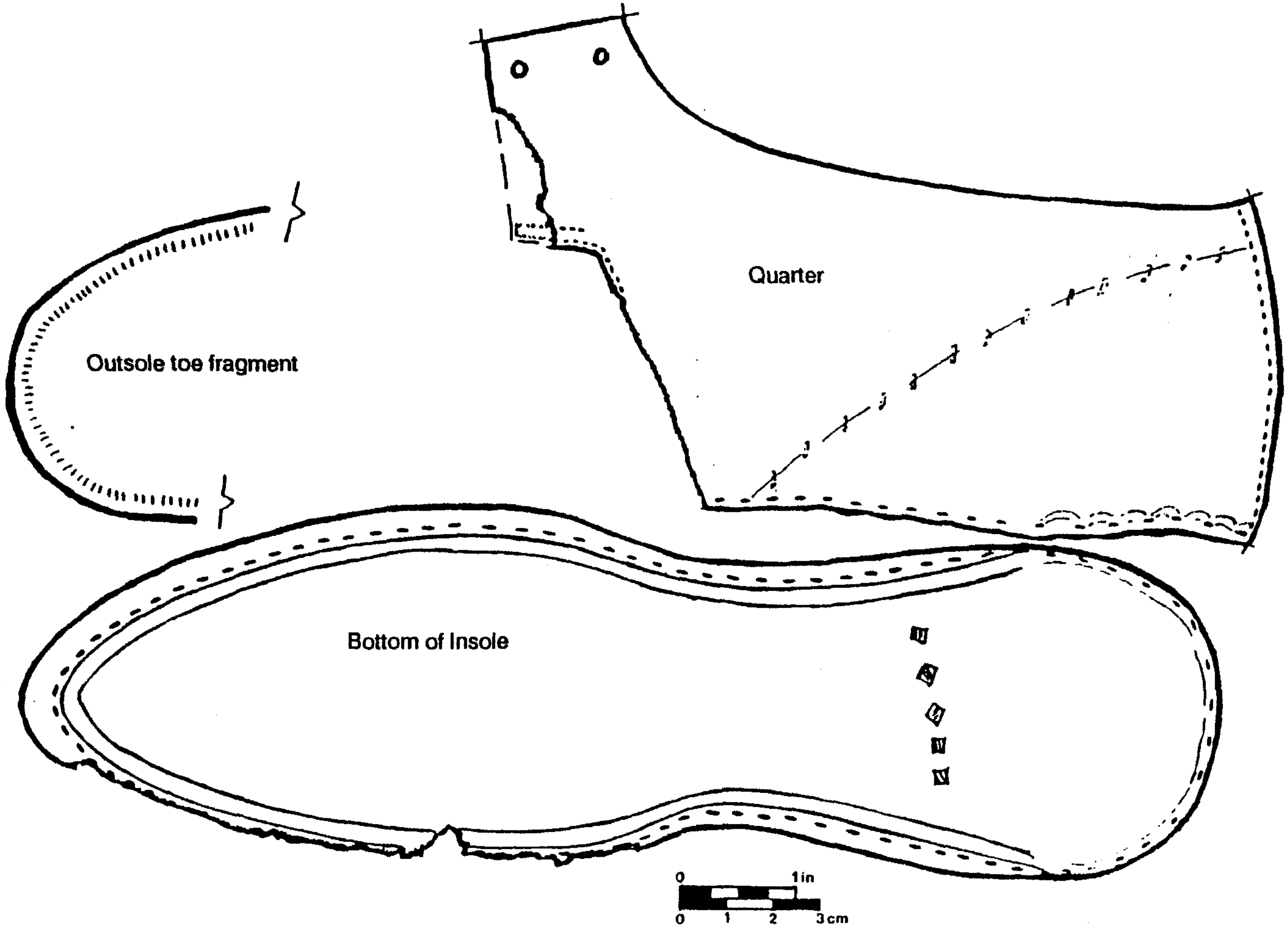


FIGURE 54. Specimen 18HA148/540.1. Man's tie shoe.

18HA148/520.3 (#11): Man's Shoe, made single row brass nailed all around. Uppers (fragmentary) 4 oz. flesh out. Side seam round-closed outside. Vamp side lining whip-stitched inside. Copper alloy nails, of square section, approximately 5/8" x 1/8" [SEE INSET]. Quarters cut off - salvaged? Three lift stacked leather heel, single row brass nailed. Made left.

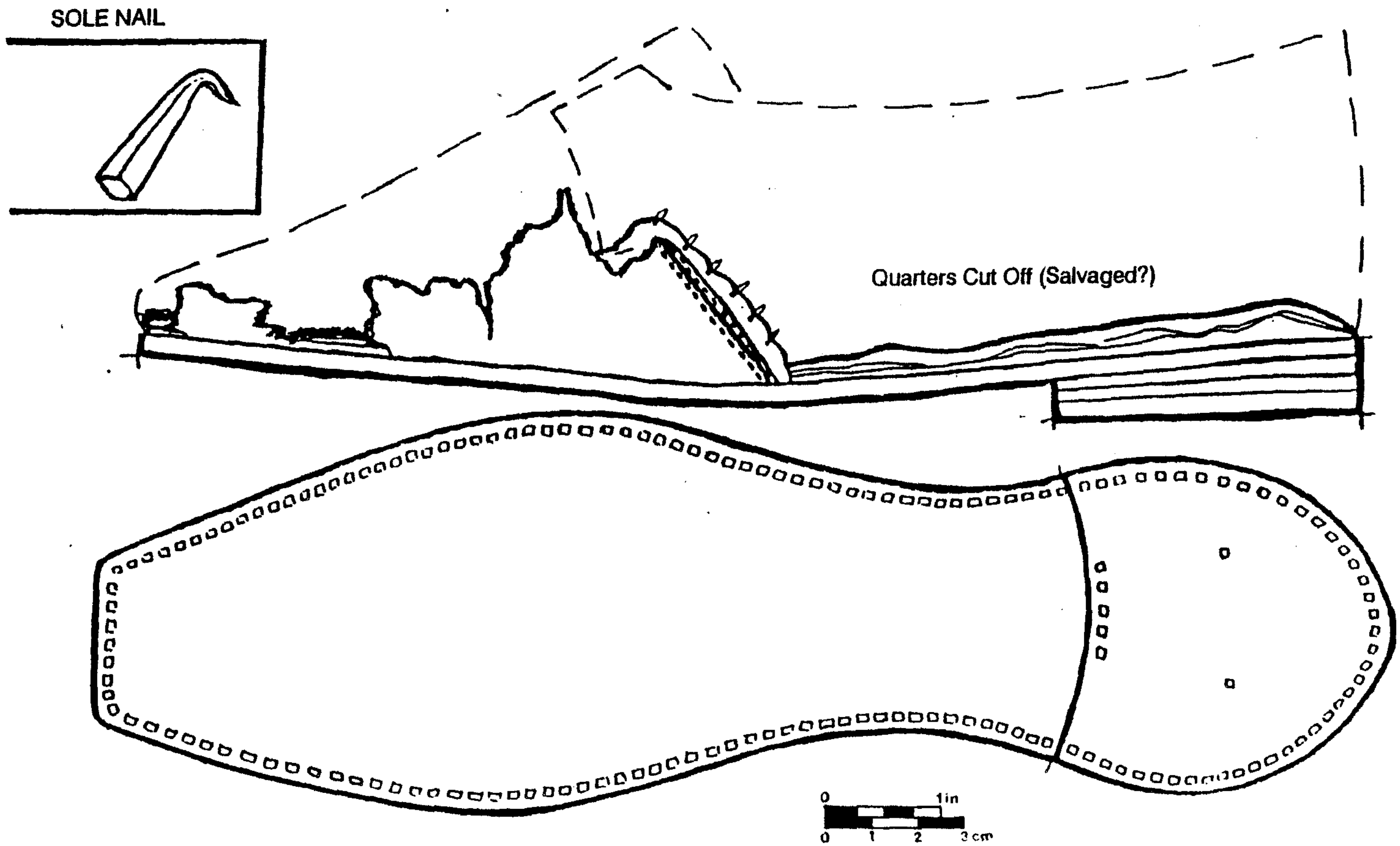


FIGURE 55. Specimen 18HA148/520.3. Man's tie shoe.

entirely replaced all other methods of sole attachment for male footwear in America.

The styles of uppers, where they survive in these shoes and boots, suggest fashions current in American footwear from late in the first quarter to early in the second quarter of the 19th century.

Toe shapes are still the 18th and early 19th century rounded shapes, with the notable exception of the two "Brass Nailed" soles, which have very fashionable squared toes. Again, with the exception of the "Brass Nailed" shoe sole (18HA148/520.3) which was made for the left foot, the shape of the soles suggest that they were made "straight," that is not shaped for either the right or left foot. This feature dominated in the 18th century, but "crookeds" made for either foot re-enter shoe fashions early in the first quarter of the 19th century, especially in Britain. "Straights" dominate in male footwear in America until the late 1850s and early 1860s, but right and left footwear occurs, though in smaller numbers, throughout the same period.

Shoe 18HA148/520.3, boot fragments 18HA148/540.2, and one leather cutting from 18HA148/533.1 indicate that leather had possibly been salvaged on the site. The shoe and boot fragment were uppers that had cut edges, where large sections had been removed. The cutting was of sole leather, and was the type of trimming cut off during the repair of a sole or heel. Three shoes showed signs of repairs to the bottoms; one to the heel and two to the soles, which might have been done on the site.

The pair of youth's shoes 18HA148/520.2 A/B, a fashionable pair for the late first quarter of the 19th century, have the repair half-soles grafted under the old sole at the waist, not over it as is usual. One of the shoes of this pair had a hole purposefully cut over the great toe to relieve pressure there.

For the most part, all of the footwear recovered from the Harford Iron Furnace site is typical laboring wear for the early 19th century, and exhibits most of the major technological abilities for shoe construction at that time. The styles range from the "work boot" of the period to fairly fashionable shoes.

As stated above, all male footwear, interpreted with the known dating of the site itself and the styles of footwear, suggest that these were the shoes and boots of the builders of the iron furnace, or the earliest occupants of the site. None of the footwear exhibited exposure to great heat, molten ore, or rough abrasion on the soles from being exposed to the operations of the furnace itself, again suggesting deposition prior to the operation of the furnace, possibly during its construction.

Glossary

Brogan: A heavy work shoe which extends to or just above the ankle. Closure is by tie. Named for the dimunitive for *brog* (shoe in Gaelic).

Tie shoe: A light or heavy shoe which extends to under the ankle. Named for the method of closure.

Wellington boot: A boot which extends to either mid-calf or the knee. Construction is with two vertical seams, one on the either side of the leg and no seam in the back. Named for Arthur, first Duke of Wellington.

APPENDIX VII

CLAY TOBACCO PIPES

by Timothy Doyle

APPENDIX VII
CLAY TOBACCO PIPES

The following is a descriptive analysis of the white clay tobacco pipes recovered in the course of excavation at the Harford Furnace site. First, the identifiable fragments are described and illustrated, followed by a discussion of previous citations in the literature. Next the unidentified pipe fragments are illustrated and described to assist future researchers by providing specimens from dated contexts. All of the tobacco pipes are from the plowzone.

Identifiable Tobacco Pipe Fragments

Peter Dorni pipes (Figure 56, A)

Peter Dorni pipes in the Harford Furnace assemblages are represented by two white clay pipestem fragments. The example illustrated is from Lot 642, while a similar stem fragment is found in Lot 506. Both specimens are from the plowzone.

Description and Discussion. The example from Lot 642 has one band of leaf designs running vertically around the broad, broken-off end of the fragment, followed by two pairs of parallel bands also running vertically around the stem. Within each pair are numerous horizontal bands connecting the vertical bands. This design continues for the rest of the fragment, but with rectangular panels set on each side of the stem which interrupt the vertical bands. One panel contains the fragmentary word "PET" and the other the fragmentary word "ORNI." The example from Lot 506 is similar to the above, but the fragment is broken such that the leaf design does not appear. The panels contain the fragmentary words "TER" and "DOR."

The design of these two marks is identical in the elements to a pipe illustrated in the 1875 Wm. Demuth and Company catalog (Sudbury and Pfeiffer 1983; Sudbury 1986: viii). This illustration shows a ring of leaf design at each end of the mark.

Many of the references to archeologically recovered Peter Dorni pipes (Omwake 1961; Pawson 1969) deal with non- or poorly-provenienced examples. Byron Sudbury (personal communication 1987) reports numerous examples in the collections of bottle-collectors in Pennsylvania. He goes on to suggest that examples of the Peter Dorni pipes are principally concentrated in the northeast of the United States. Omwake (1961) discusses specimens from Fort Ticonderoga, New York; the Seven Mile House, near Albany, New York; the Travis site, Long Island, New York; the Ouiatanon site, Wabash Township, Indiana; and from Ontario and Delaware (no site specified). Brown et al. (1986: Appendix D, Catalog Number 55) report an example recovered in a shovel test pit during an archeological survey near Texas, Maryland.

The identity of the original Peter Dorni has not been determined, though some candidates exist. G. C. Helbers (as reported in Omwake 1961) describes Dorni (or "Dornier") as a pipemaker in the north of France, in operation by at least 1850. Helbers notes the great popularity of Dorni's pipes in the United States, such that by 1880 the Dutch firms Goedewaagen and Van der Want were copying the style for export. Oswald (1975:119) also identifies Dorni as a French pipemaker, working from 1850 to 1880, and observes that his popular pipe style was copied by Scottish firms.

That Goedewaagen was manufacturing and exporting Peter Dorni pipes is demonstrated in the circa 1900 Goedewaagen Export Catalogue as reproduced in Duco

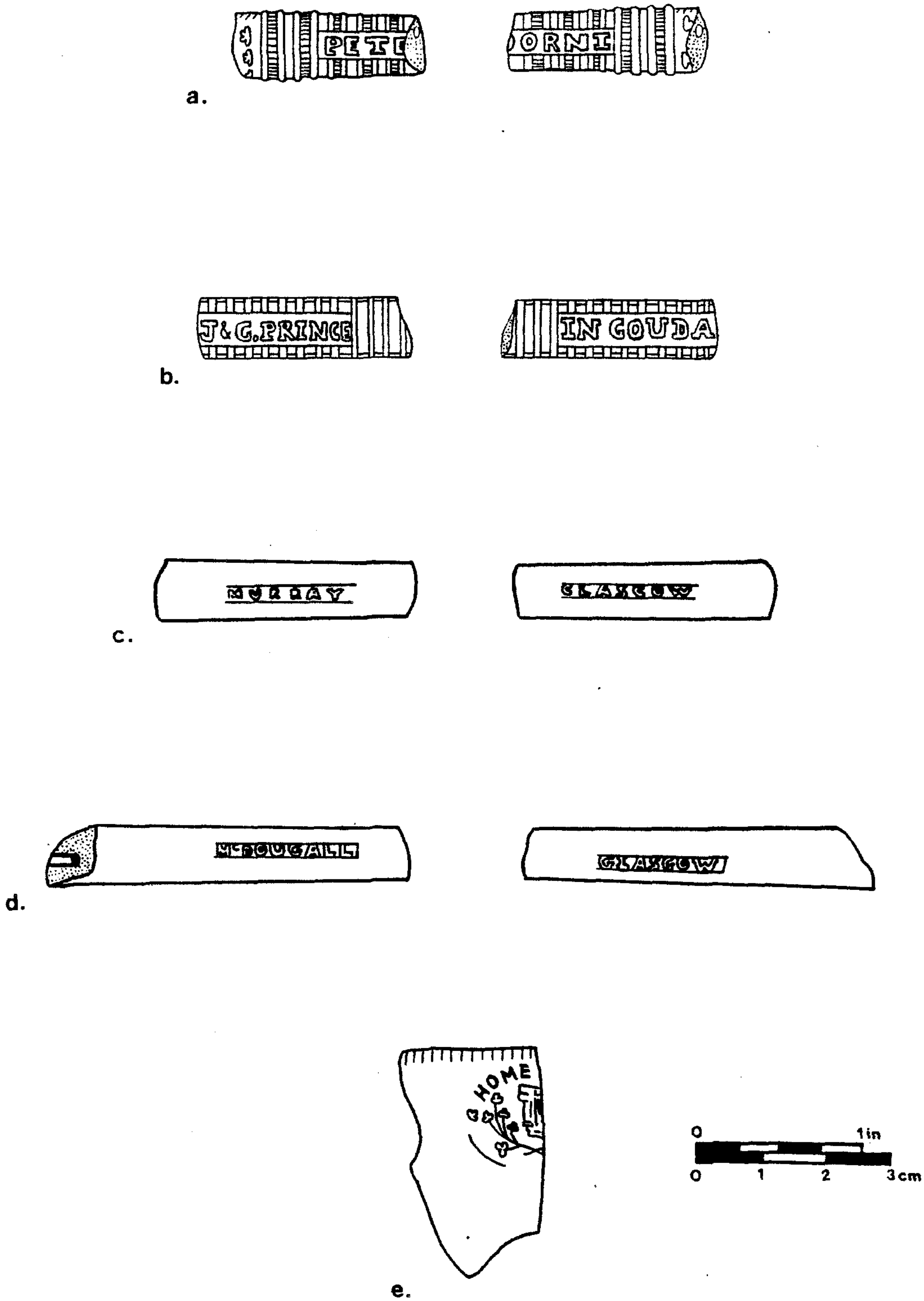


FIGURE 56. Identifiable tobacco pipe fragments.

(1986). This catalog includes a small illustration of a pipe (Number 304) which generally matches the stems recovered at 18HA148. Many elements of the design are missing from the catalog illustration, though it is difficult to say if this is the result of a simplification of the mark by Goedewaagen or if the minor details were simply not included in the small illustration. Among the Scottish firms, D. McDougall and Company (The Glasgow Pipe Manufactory) published an "Irish Price List" in 1875, as reproduced in Sudbury (1980), which lists a pipe Number 139, "Peter Dorni," selling at 2 pounds, 4 pence per gross, box included. Of the 168 pipe styles listed, 72 sold for less than the Peter Dorni, 16 for the same price, and 79 were more expensive. The range in prices was from a low of 1 pound, 5 pence to a high of 5 pounds, 6 pence.

As discussed above, in 1875 Wm. Demuth and Co. of New York City published a catalog, reproduced in Sudbury and Pfeiffer (1983), that contains an illustration of a Peter Dorni pipe that matches in nearly all particulars one of the stems recovered at 18HA148. While the styles of the marks on the two stem fragments are identical, there are differences in the dimensions, most notably in the heights of the panels and of the letters. Although the Demuth illustration appears to correspond to the stem fragment with the smaller panel and larger letters (Lot 642), the direction of taper of the stem indicates that the Christian and surname on the stem fragment are reversed from the orientation indicated in the 1875 illustration. Sudbury and Pfeiffer (1983) caution that there is no evidence that any of the pipes in the catalog were actually manufactured by Wm. Demuth and Co., which is described as a manufacturer and importer of pipes and pipe-related materials. The possibility thus exists that the pipe illustrated was actually manufactured by some other firm, perhaps even D. McDougall and Company.

In addition to Scotland and Holland, there is evidence that imitation Peter Dorni pipes were being produced in England and Germany, and Germany has been proposed by both John McCashion and Martin Kugler as yet another location for the original Peter Dorni (Byron Sudbury, personal communication 1987).

J.C. Prince Pipes (Figure 56, B)

This white clay pipestem fragment is from Lot 696. Two other examples were recovered: one nearly complete maker's mark on a stem also from Lot 696, and a fragmentary piece bearing only the initial "J" from Lot 432. All of the specimens are from the plowzone.

Description and Discussion. The portion of stem represented in these artifacts is marked by parallel raised bands running vertically around the stem, with rectangular panels inset on each side. One panel contains "J & C PRINCE" and the other "IN GOUDA," all in raised capital block letters. This specimen is probably from the firm of Jan (and Cornelis?) Prince, in operation from 1773 to 1898 (Oswald 1975:118).

Murray Pipes (Figure 56, C)

One example of this white clay pipestem fragment was recovered and is found in Lot 503 (plowzone).

Description and Discussion. This specimen is represented by a plain stem with impressed capital block letters spelling "MURRAY" on one side and "GLASGOW" on the other. It has been identified as a product of William Murray and Company, in operation from 1830 to 1861 (Oswald 1975:205).

McDougall Pipes (Figure 56, D)

Two examples of this mark were recovered; both are white clay pipestem fragments. The specimen illustrated is from Lot 696 while a second fragmentary example is from Lot 429. Both examples are from plow zone.

Description and Discussion. This type of marked pipe is a plain stem with impressed capital block letters, "McDOUGALL" on one side and "GLASGOW" on the other. It has been identified as a product of Duncan McDougall and Company, the Glasgow Pipe Manufactory which was in operation from 1847 to 1868 (Oswald 1975:205).

Home Rule Pipes (Figure 56, E)

One white clay pipebowl fragment (from Lot 469) with the word "Home" impressed into it was recovered from the plowzone.

Description and Discussion. The impressed design consists of the word "HOME" in capital block letters, running in an arc above the remainder of the design. The central element is incomplete and somewhat eroded, but is probably a harp; comparison with an identical piece recovered elsewhere (see below) confirms this. Below the central element are crossed stems with shamrocks. Finally, there is a very faint rouletted band around the bowl rim.

This example belongs to the class of "Irish Pipes" (Alexander 1986; Oswald 1975:110), more specifically, the "Home Rule" pipes produced to popularize the Irish political movement of the same name. This movement was active from approximately 1870 to 1916 (Alexander 1986). Oswald (1975:110) notes that the Irish pipes were "aimed apparently at the navvy population." The Penguin English Dictionary (Garmonsway 1969) defines "navvy" as "a labourer employed on manual digging in constructing roads, railways, sewers etc. . ."

Alexander (1986) reports a Home Rule pipe dating to 1850-1880 recovered from a garbage dump near Lewes, Delaware. This pipe shares the rouletted band and "HOME RULE" in an arc on the rear face of the bowl, but none of the other design elements are present. An example similar to the Lewes pipe was found at the Johns Creek Cabin site, 18CV217, in Calvert County, Maryland (Hurry, Kavanagh, and Curry 1987:112).

A pipebowl identical to the Harford Furnace example was recovered as a surface find from the Eleysville Rock Shelter (18HO10) in Howard County, Maryland (Maryland State Archeological Site Files). These two pipebowls bear a strong resemblance to a pipe illustrated in the 1875 catalog of Wm. Demuth and Company, a maker and importer of pipes and pipe-related material operating in New York City for at least the last quarter of the nineteenth century (Sudbury and Pfeiffer 1983).

Unidentifiable Tobacco Pipe Fragments

Thistle Pipes (Figure 57, A)

This decorative element is represented on three white clay bowl fragments; the fragment illustrated is from Lot 632, while the remaining two are from Lots 390 and 469.

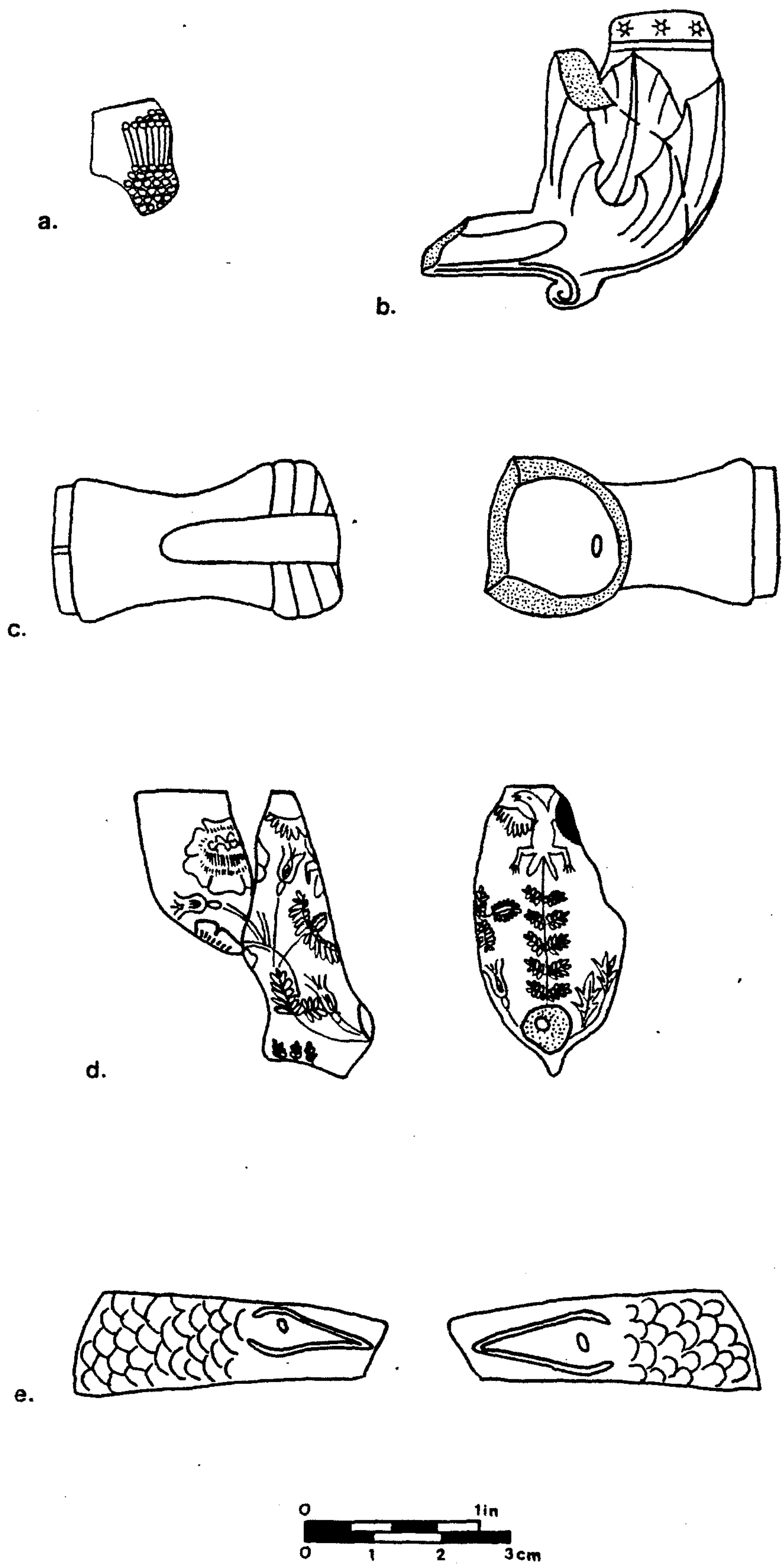


FIGURE 57. Unidentifiable tobacco pipe fragments.

Description and Discussion. This design apparently represents a thistle, which Oswald (1975:110) identifies as a common nineteenth century element on molded pipes.

Tulip Pipes (Figure 57, B)

The pipebowl illustrated here is a composite of two overlapping fragments from different bowls with identical designs. The basal portion of the illustrated bowl represents in its entirety the example from Lot 504, while the rim portion of the illustration represents a fragment from Lot 696, minus the area of overlap with the base. This style of decoration is further represented by three additional fragments from Lot 696 and one fragment from Lot 408.

Description and Discussion. This decoration probably represents some type of leaf motif (holly, for example), another common nineteenth century design; a similar pipe is illustrated in Oswald (1975:101). Chance and Chance (1976:170) report an identical specimen from the Kanaka Village/Vancover Barracks site with a context date of ca. 1850. They describe the floral motif as "a four-petaled flower, possibly a tulip."

Porcelain Pipe (Figure 57, C)

This example is of a single pipebowl from Lot 696.

Description and Discussion. This specimen represents a white porcelain reed-stem pipe. No references to porcelain reed-stem pipes of this style have been found in the literature. Five additional reed-stem pipe fragments were recovered from the excavations at Harford Furnace (two stoneware and three red earthenware). These have not been illustrated as none were decorated and all are very fragmentary.

Floral, Lizard (?) Pipe (Figure 57, D)

The white clay pipebowl illustrated is composed of two mending fragments. The larger rim-to-base fragment is from Lot 696, and the smaller rim fragment is from Lot 432.

Description and Discussion. This is a highly-ornate, finely-detailed molded pipebowl. The motif is principally floral, with the exception of the winged lizard (?) on the rear face. Both the front and back seams have been incorporated into the floral motif. Also note the asymmetry of the design evident in the rear view, with flowers and feather-like leaves to the left of the back-seam, and branches bearing holly leaves to the right. This asymmetry suggests a representation of different seasons of the year (e.g. spring/winter), but not enough of the right bowl face is present to really support this.

Fish Pipe (Figure 57, E)

This design is represented by one white clay stem fragment, from Lot 696.

Description and Discussion. This decoration is apparently a stylized representation of some type of fish. While differing greatly as to detail, there is a pipe (Number 548) of similar style illustrated in the circa 1900 Goedewaagen Export Catalogue (Duco 1986:95).

Summary

The marked and decorated clay tobacco pipes from the Harford Furnace site date to the generalized period encompassing most of the 19th century. This is in keeping with other chronological indicators recovered in the excavations. No attempt to utilize the Harrington (1978) or Binford (1978) stem bore dating techniques was undertaken as Walker (1978) has clearly demonstrated that stem bore diameter dating is ineffective with 19th century samples.

APPENDIX VIII

FLORAL ANALYSIS OF HARFORD FURNACE

by Cheryl A. Holt

APPENDIX VIII
FLORAL ANALYSIS OF HARFORD FURNACE

Introduction

Floral specimens comprise a special and unique set of data. Floral specimens differ from more conventional artifacts (ceramics, glass, metal) in fundamental ways. Floral specimens are biodegradable whereas more conventional artifacts are not. Most conventional artifacts are directly associated with human behavior whereas all seeds are not. More problems are associated with quantification of floral specimens than are associated with more conventional artifacts.

Although seeds do not "behave like other artifacts," this does not negate their value to historic research. Vegetables, grains, nuts, and fruit have universally played an important role in peoples' diet. In addition, plants were utilized for purposes beyond subsistence such as raw materials for textiles, dyes, and herbal medicines as well as the aesthetics of a flower garden. This research capitalizes on the unique interplay seeds have with culture and the environment, and formulates research questions that integrate floral data into general and specific research goals for the Harford Furnace site.

The primary goal of the research was to ascertain floral patterning which might be suggestive of a particularized domestic lifestyle associated with an industrial cash economy. Specific research questions focus upon the site inhabitants' commitment to agriculture and participation in a market economy.

Description of Data Base

A total of 30 flotation samples were examined from site features (Table 36). The preservation of the recovered floral specimens was good and a variety of floral material was represented within the samples. The seed specimens were not highly fragmented or damaged. The smallest seed recovered was 2 mm in length and 1.6 mm in width. The smallest seed size recovered is noted because this is a sampling bias which impacts interpretation.

A total of 262 seeds was recovered from the 30 samples. Twenty-eight plant types were identified. Table 37 gives a listing, a total, and the percentage of the total for all seeds recovered from the site area. Figure 58 illustrates specimen recovery frequency for the site.

A total of 27 specimens was charred. This comprised 10% of the total assemblage.

Methodology

Each sample was examined and systematically scanned with a binocular dissecting microscope. Floral material was identified and counted. Each floral specimen was given a count value of one. Material was identified in most cases to the species level. Confirmation of species was aided by cross checking with an extensive type collection of floral material and cross checking floral identification manuals (Fernald 1970; Gunn 1972; Mohlenbrock 1980, 1981; Cox 1985; Renfrew 1973; Martin and Barkley 1961; Martin 1972; Lawrence and Fitzsimons 1985).

TABLE 36. Context of floral specimens.

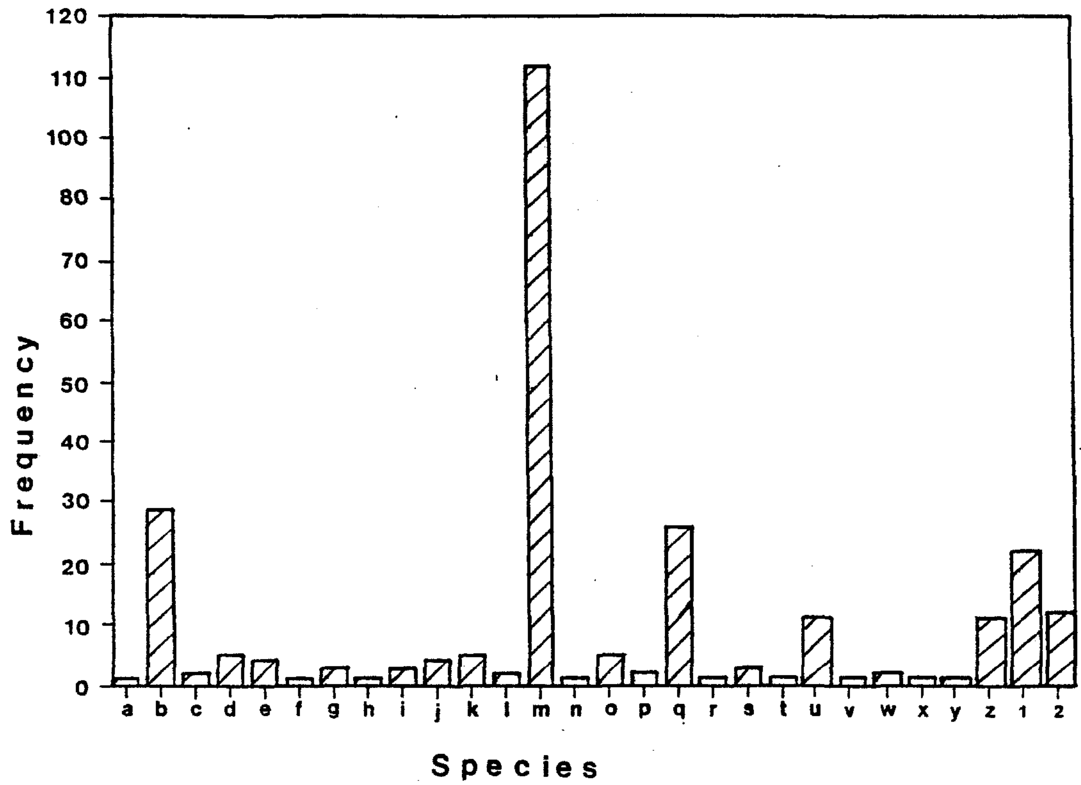
lot #	feat. #	botanical specimen	common name	#
601	79	Liriodendron tuipfera	Tuliptree	1
602	80	Liriodendron tuipfera	Tuliptree	2
602	80	Parthenocissus quinquefolia	Woodbine	3
603	81	Brassica sp.	Mustard	
620	33	Brassica sp.	Mustard	3
620	33	Polygonatum biflorum	Soloman's Seal	1
622	34	Podophyllum peltatum	May Apple	2
626	38	Liriodendron tuipfera	Tuliptree	1
628	37	Tsuga canadensis	Hemlock	1
631	57	Datura stramonium	Jimsonweed	1
632	57	Datura stramonium	Jimsonweed	1
632	57	Ambrosia trifida	Ragweed	1
633	70	Trifolium sp.	Clover	1
635	40	Brassica sp.	Mustard	1
636	41	Linaria vulgaris	Butter and Eggs	2
636	41	Brassica sp.	Mustard	1
637	42	Brassica sp.	Mustard	3
649	82	Datura stramonium	Jimsonweed	1
649	82	Liriodendron tuipfera	Tuliptree	2
651	84	Prunus sp.	Cherry	4
651	84	Crataegus rotunadafolia	Hawthorn	1
651	84	Brassica sp.	Mustard	1
656	92	Galium molungo	Bedstraw	1
663	103	Linaria vulgaris	Butter and Eggs	1
664	105	Brassica sp.	Mustard	1
664	105	Liquidambar styraciflus	Sweetgum	5
665	106	Brassica sp.	Mustard	1
665	106	Phtolacca americana	Pokeweed	8
665	106	Circium sp.	Thistle	1
667	101	Polygonatum biflorum	Soloman's Seal	1
668	104	Liriodendron tuipfera	Tuliptree	1
		TOTAL		54

TABLE 36 (Continued).

lot #	feat. #	botanical specimen	common name	#
512	120	Smilax hispida	Greenbriar	3
514	120	Quercus sp.	Oak	1
515	120	Rubus sp.	Blackberry	9
515	120	Amphicara beacteata	Hog Peanut	1
515	120	Datura stramonium	Jimsonweed	2
516	120	Rubus sp.	Blackberry	9
516	120	Datura stramonium	Jimsonweed	3
516	120	Phtolacca americana	Pokeweed	54
517	120	Rubus sp.	Blackberry	4
517	120	Prunus sp.	Cherry	2
517	120	Aronia Arbutifolia	Chokeberry	2
517	120	Tsuga canadensis	Hemlock	9
517	120	Datura stramonium	Jimsonweed	1
517	120	Phtolacca americana	Pokeweed	5
517	120	Circium sp.	Thistle	4
517	120	Liriodendron tuipfera	Tuliptree	1
517	120	Parthenocissus quinquefolia	Woodbine	30
518	120	Rubus sp.	Blackberry	3
518	120	Prunus sp.	Cherry	4
518	120	Datura stramonium	Jimsonweed	3
518	120	Phtolacca americana	Pokeweed	1
518	120	Curcurbitaceae sp.	Squash/Melon	1
518	120	Parthenocissus quinquefolia	Woodbine	2
519	120	Rubus sp.	Blackberry	3
519	120	Rumex crispus	Dock	1
519	120	Tsuga canadensis	Hemlock	2
519	120	Datura stramonium	Jimsonweed	4
519	120	Polygonum aviculare	Knotweed	2
519	120	Panicum sp.	Millet	1
519	120	Prunus persica	Peach	4
519	120	Circium sp.	Thistle	3
519	120	Liriodendron tuipfera	Tuliptree	3
519	120	Parthenocissus quinquefolia	Woodbine	1
520	120	Rubus sp.	Blackberry	1
520	120	Cornus florida	Dogwood	2
520	120	Tsuga canadensis	Hemlock	8
520	120	Datura stramonium	Jimsonweed	4
520	120	Podophyllum peltatum	May Apple	1
520	120	Prunus persica	Peach	3
520	120	Lepidium sativium	Peppergrass	1
520	120	Phtolacca americana	Pokeweed	1
520	120	Circium sp.	Thistle	1
520	120	Liriodendron tuipfera	Tuliptree	5
526	120	Prunus persica	Peach	1
		TOTAL		206

TABLE 37. Floral species recovered from Harford Furnace.

common name	botanical specimen	total	%	charred
Bedstraw	Galium molungo	1	0.38%	
Blackberry	Rubus sp.	29	11.07%	
Butter and Eggs	Linaria vulgaris	2	0.76%	1
Cherry	Prunus sp.	5	1.91%	
Chokeberry	Aronia Arbutifolia	4	1.53%	
Clover	Trifolium sp.	1	0.38%	1
Dock	Rumex crispus	3	1.15%	
Dogwood	Cornus florida	1	0.38%	
Greenbriar	Smilax hispida	3	1.15%	
Hawthorn	Crataegus rotunadafolia	4	1.53%	
Hemlock	Tsuga canadensis	5	1.91%	
Hog Peanut	Amphicara beacteata	2	0.76%	
Jimsonweed	Datura stramonium	102	38.93%	
Knotweed	Polygonum aviculare	1	0.38%	
May Apple	Podophyllum peltatum	5	1.91%	
Millet	Panicum sp.	2	0.76%	
Mustard	Brassica sp.	26	9.92%	24
Oak	Quercus sp.	1	0.38%	
Peach	Prunus persica	3	1.15%	
Peppergrass	Lepidium sativium	1	0.38%	
Pokeweed	Phtolacca americana	11	4.20%	
Ragweed	Ambrosia trifida	1	0.38%	
Soloman's Seal	Polygonatum biflorum	2	0.76%	1
Squash/Melon	Curcurbitaceae sp.	1	0.38%	
Sweetgum	Liquidambar styraciflus	1	0.38%	
Thistle	Circium sp.	11	4.20%	
Tuliptree	Liriodendron tuipfera	22	8.40%	
Woodbine	Parthenocissus quinquefolia	12	4.58%	
total	(28 species)	262	100.00%	27
			% charred	10.31%



a : BEDSTRAW
b : BLACKBERRY
c : BUTTER AND EGGS
d : CHERRY
e : CHOKEBERRY
f : CLOVER
g : DOCK
h : DOGWOOD
i : GREENBRIAR
j : HAWTHORN
k : HEMLOCK
l : HOG PEANUT
m : JIMSONWEED
n : KNOTWEED
o : MAY APPLE
p : MILLET
q : MUSTARD
r : OAK
s : PEACH
t : PEPPERGRASS
u : POKEWEED
v : RAGWEED
w : SOLOMAN'S SEAL
x : SQUASH/MELON
y : SWEETGUM
z : THISTLE
1 : TULIPTREE
2 : WOODBINE

FIGURE 58. Frequency of floral species recovered from Harford Furnace.

Discussion of Recovered Specimens

The following is a discussion of the recovered plants from Harford Furnace. Table 38 depicts the general characteristics of each recovered species. The discussion includes historical attitudes about the plant as well as the physical properties of the plant. It is not enough to merely list the observed species. It is important to understand the physical properties of the plant which result in cultural uses of the plant. The cultural attitudes toward the plant are important in interpretation of how the plant may have been used.

The descriptions include the characteristics of the plants recovered and discusses historically documented uses of the plants. The uses and attitudes towards many plants have changed through time. There are numerous reasons for an increased or decreased utilization of a particular plant. Increased sophistication in medicinal practices and availability of patent medicines may reduce the amount of herbs collected and grown for home remedies. As agricultural knowledge translated into more sophisticated farming techniques, some plant species were eliminated in favor of other species that were more disease resistant, bore larger fruit, had a longer growing season, or in general exhibited more desirable characteristics.

Increased participation in a market economy also impacted the range and variety of utilized vegetables, fruits, grains, and nuts. A market economy allowed consumers to have access to plant products previously not available in their immediate vicinity. Exotic plant foods that required highly specialized growing conditions and were thereby difficult and expensive to obtain took on connotations of status.

Cultural attitudes can place negative connotations on plant food. The types of plants grown in the kitchen garden changed considerably during the nineteenth century. Cholera outbreaks were common in the mid 1800s and people were advised to abstain from all garden vegetables. Many Americans, including a large percentage of physicians, believed that raw or unboiled produce helped spread cholera and typhoid. The cholera stigma associated with unboiled produce persisted through the 19th century (Tice 1984:53).

Assessments of popularity during the temporal framework of Harford Furnace were made from a number of sources. Lists of plants from period landscapes were developed from contemporary sources (i.e., seed catalogs, journals, newspapers, diaries, correspondence, seed orders, etc.) from Favretti and Favretti (1978), Tice (1984), Shaker Seed Catalog (Anonymous 1843), Betts (1944), Hedrick (1950), Kline, Becker and Belluscio (1986), Miller (1759), and Leighton (1970, 1976).

Ornamental

Smooth Bedstraw (*Galium mollugo*) is a perennial that was introduced from Europe. Bedstraw was a popular garden plant as early as the 1700s; however it has escaped cultivation and is now found in fields, pastures, and waste areas. The small numerous flowers are quite fragrant and were dried and stuffed into mattresses and pillows. The young shoots can be cooked and eaten as greens and as early as the 16th century this plant was described as a food for those who did not wish to become fat. The dried and roasted seeds were used as a substitute for coffee. Its seeds may contain caffeine and caffeol, the oil that gives coffee its flavor. This plant was also used as a tonic and diuretic. The fresh leaves were crushed and made into a salve

TABLE 38. Frequency and characteristics of floral species recovered from Harford Furnace.

common name	botanical specimen	total	type	type total	%
Millet	Panicum sp.	2	c	2	0.76%
Dock	Rumex crispus	3	m		
Mustard	Brassica sp.	26	m		
Peppergrass	Lepidium sativium	1	m		
Pokeweed	Phtolacca americana	11	m		
Squash/Melon	Curcurbitaceae sp.	1	m		
				42	16.03%
Bedstraw	Galium molungo	1	o		
Butter and Eggs	Linaria vulgaris	2	o		
Soloman's Seal	Polygonatum biflorum	2	o		
				5	1.91%
Blackberry	Rubus sp.	29	t		
Cherry	Prunus sp.	5	t		
Chokeberry	Aronia Arbutifolia	4	t		
Dogwood	Cornus florida	1	t		
Hawthorn	Crataegus rotunadafolia	4	t		
Hemlock	Tsuga canadensis	5	t		
Oak	Quercus sp.	1	t		
Peach	Prunus persica	3	t		
Sweetgum	Liquidambar styraciflus	1	t		
Tuliptree	Liriodendron tuipfera	22	t		
				75	28.63%
Clover	Trifolium sp.	1	w		
Greenbriar	Smilax hispida	3	w		
Hog Peanut	Amphicara beacteata	2	w		
Jimsonweed	Datura stramonium	102	w		
Knotweed	Polygonum aviculare	1	w		
May Apple	Podophyllum peltatum	5	w		
Ragweed	Ambrosia trifida	1	w		
Thistle	Circium sp.	11	w		
Woodbine	Parthenocissus quinquefolia	12	w		
				138	52.67%
Total		262		262	100.00%

KEY

c = crop m = medicinal & culinary
o = ornamental t = tree & shrub
w = weeds & vines

(Cox 1985). However, there is no documentation that Bedstraw was commonly used in the above mentioned ways during the period of 1850-1900 (Favretti and Favretti 1978).

Solomon's Seal (*Polygonatum biflorum*) is a native perennial with attractive bell shaped flowers and small berries. There is no documentation concerning the popularity of this ornamental plant in the 1600s; however by the 1700s it was listed in seed catalogs and appeared in garden plans of that period (Favretti and Favretti 1978). The popularity of the plant continued through the 19th and early 20th centuries. The berries of the plant persist until late fall and therefore are utilized by birds when other food sources become scarce. The berries have a toxic effect on humans although the roots were used medicinally for healing wounds (Cox 1985). Solomon's Seal is most commonly found today as a wildflower in a forest environment.

Butter and Eggs (*Linaria vulgaris*) is a perennial introduced from Europe. It is an attractive plant producing masses of flowers throughout summer and into autumn. It grows well as an ornamental for flower gardens, especially in poor soil where other flowers would not survive. The dried plant has been used as a diuretic and purgative. A poultice of the fresh leaves and an ointment made from the flowers are recommended in herbology for sores and diseases of the skin (Cox 1985). It is now found in fields, along roadsides, and in waste areas.

Ornamentals comprised roughly 2% of the total assemblage. All three ornamentals have escaped cultivation and are now most likely to be found in a natural context.

Culinary and Medicinal

The cultivation of herbs in America reached its peak in the 18th century. The Shakers became America's professional herbalists. They were the first to grow and sell medicinal herbs on a large scale. The herbs were made into ointments, salves, medicines of all kinds, pills, and powders (Boxer and Back 1980:11). By the middle of the 1800s awareness of scientific method was filtering into middle class life. People had more information on botany and chemistry, which was liberally admixed with practical information. The industrial revolution brought more people into urban areas, which offered no space for gardens. As society became increasingly more industrialized, there was a natural shift and change in priorities and in the amount of time people had to devote to horticultural activities. Patent medicines became widely available and grew in popularity. A cash economy allowed people to purchase food items rather than produce them themselves.

Mustard (*Brassica juncea*) is one of the oldest known culinary and medicinal herbs. Mustard greens were used in salads and cooked as greens. The seeds were used whole as a pickling spice and were ground to make mustard. As a remedy for various ills, mustard was used in many ways: as oil, tincture, poultice and plaster, for headaches, fevers, whooping-cough, liver, and stomach complaints (Clair 1961:210). The crushed seeds were applied as a chest plaster for pneumonia, bronchitis, and other respiratory ailments. The seeds of all plants in this genus are relished by the morning dove, ring-necked pheasant, and the finch (Cox 1985). Mustard comprised 80% of the charred specimens. Mustard was brought to America by the colonists (Clarkson 1942) and has now gained the status of a garden weed.

Dock (*Rumex altissimus*) appears in herb gardens as early as 1600 (Favretti and Favretti 1978). Dock was utilized by cooking as greens and made into an ointment for boils, sores, and swellings. The root was also used as a laxative, an astringent, and for other medical tasks. Dock is quite high in vitamins A and C. People suffering from loosening teeth caused by vitamin C deficiency benefited from the consumption of dock as a "spring tonic." Dock is a moist soil plant. Today, dock is considered a noxious weed and inhabits fields, lawns, and waste places.

Pokeweed (*Phytolacca americana*) is a perennial with dangling clusters of berries which serve as an important food source for songbirds and mammals. It is native to the eastern United States. The young shoots of Pokeweed can be prepared as asparagus or pickled. However, the root, the mature plant, and the seeds are poisonous. In the 19th century the dried root was used to induce vomiting. The juice from the mature berries has been used to color food and wine and as a pigment for paint and as a writing fluid (Cox 1985). Today, Pokeweed is considered a troublesome weed and is found in newly cleared areas, pastures, fields, and waste places.

Peppergrass (*Ledpidium virginicum*) is an annual with a long slender taproot. Peppergrass is sometimes called Poor-man's pepper because the seed pods are peppery to the taste and can be used for seasoning. The young leaves can be cooked as greens or added raw to salads. Peppergrass has escaped cultivation and is now found along roadsides and in neglected fields and meadows (Cox 1985:188). Peppergrass is contained in *A Shaker Gardener's Manual* which was published in 1843. This suggests that Peppergrass was a popular vegetable during the time of occupation at Harford Furnace.

Curcurbits (*Curcurbita sp.*) comprise a large botanical family of gourds, melons, cucumbers, and pumpkins. The specimen variety could not be determined beyond genus. They are distinctly American and were intensively utilized by the American Indian. Curcurbits have consistently maintained popularity as a desired food item. Curcurbits require cultivation and are not observed in the wild state.

Sixteen percent of the assemblage was comprised of garden plants; however all the culinary and medicinal plants recovered (except the curcurbits) have escaped cultivation and are now considered weeds.

Crops

Millet (*Panicum sp.*) is a small-seeded grass ranging from one to four feet in height. The heads of millet are dense spikes which contain the seeds. Millets are sown in drills or cultivated rows in late spring or early summer. The grain is harvested by the same methods used for wheat, barley, or rice. Hulled millet grains were cooked into a porridge or ground into flour. Millets were also grown for hay and pasture. It is of importance to note that millet is one of the hardiest cereals, capable of fending for itself in the wild state but responding well to the most rudimentary care (Root 1980:262). It will grow on very inhospitable soil. Its small seeds facilitate its spread, with the aid of birds and the wind. It keeps well in storage, however it has no gluten and millet flour does not rise.

Millet was the only crop plant recovered from the site area. Only two millet seeds were recovered and it comprised less than 1% of the total assemblage.

Trees and Shrubs

Chokeberry (*Aronia arbutifolia*) is a spreading shrub which can grow to the height of a slender tree. It thrives in moist soil. The fruit on this attractive ornamental is favored by birds (Yepsen 1976:72). It was used as a border shrub in landscaping as early as 1700 (Favretti and Favretti 1978).

Cherry (*Prunus sp.*) trees are medium-sized trees which flower in the spring and give fruit in the summer. It could not be determined whether the specimens were black, sweet, or pin cherry. If it were grown on the site it is most likely a sweet or pin cherry which does well in moist soil as opposed to the black cherry which does not. If purchased, it was most likely the sweet cherry.

Tuliptree (*Liriodendron tulipifera*) or yellow poplar is one of the most attractive species of eastern forests. The Tuliptree grows a straight tall trunk with few branches near the ground. Tulip trees are opportunists. They spring up in every available clearing and quickly rise to canopy level. They must in order to survive, because the seeds do not sprout in the dense shade of a mature forest. Tulip poplars are trees of deep, moist soils and are conspicuous members of the mixed mesophytic forest. The tree is named for the tulip like flowers which open in May or June. A tonic made from the root bark was used to treat chronic rheumatism and fevers, but this tree disappeared from the pharmacopoeia of the United States in 1882 (Yepsen 1976:272).

The eastern hemlock (*Tsuga canadensis*) is unrelated to the poison hemlock used by Socrates. In fact, the eastern hemlock is not only safe, but has medicinal value. A vitamin-rich tea of the inner bark was used by American Indians to induce a sweat (Yepsen 1976:242). The inner pink layer of bark will dye cloth a dull red. Hemlock wood is brittle and splintery and is not the best choice for firewood as it throws sparks.

Sweet gum (*Liquidambar styracifla*) is a large conical or domed tree. It is common to wet mixed woodlands (Lawrence and Fitzsimons 1985).

Oak (*Quercus sp.*) is a large deciduous productive tree with acorns rich in food value. Acorns were a valuable feed for hogs. As hog feed, a gallon of acorns may be equal to eight or ten ears of yellow corn in calories, however acorns are low in protein. Acorn-fed pigs brought lower prices on the market in 1916 (Yepsen 1976:166). Oaks will grow in a variety of climate and soil regimes (Lawrence and Fitzsimons 1985).

The dogwood (*Cornus florida*) is a beautiful ornamental. The bark has some medicinal value. The Indians made a tea of it to reduce fevers, as did Southerners during the Civil War, when the then current remedy, quinine, was unavailable (Yepsen 1976:236).

Botanists conservatively estimate two hundred different species of blackberries (*Rubus sp.*). Blackberries are shrubs with multi-seeded fruit. The hard seeds can pass through the digestive system of birds and man without harm. Blackberries can thrive in poor soils, along fence rows, in clearings, in open woods, and in thick brush. The blackberry grows most plentifully in the eastern United States. Improved varieties have been developed by cultivation but the wild fruit is still eaten in the largest proportion (Root 1980:34).

Hawthorn (*Crataegus rotunadafolia*) is a native small thorny tree with white double flowers in spring and attractive red berries in the fall. Hawthorn is quite common in the northeastern United States. The hawthorn grows in such a manner as to make an ideal fence row and was used as such at Monticello, Mount Vernon (Reppert 1976), and elsewhere as early as the 1700s (Favretti and Favretti 1978). Hawthorn berries are variable in taste and size as some are so small that they are hardly worth collecting and others are fleshy but don't taste very good raw. The berries are made edible by cooking and there is documentation that early settlers used them in jams and jellies. The utilization of this fruit would have been somewhat labor intensive and there is no substantial documentation for continued utilization of hawthorn berries in the 1800s.

The first Spanish explorers brought the peach (*Prunus persica*) to the new world. Explorers, settlers, and Indians were responsibile for a wide distribution of the fruit in the western hemisphere. "Stones" of good peaches remained a friendly currency throughout the 18th century (Hedrick 1950). Many of the varieties grown in those early days were apparently better suited for making brandy than for general consumption as fresh fruit. Peach brandy became a staple, like cider.

Commercial peach growing in the United States began early in the 19th century, when large seedling orchards were planted in Maryland, Delaware, and New Jersey. The land and climate in New Jersey, Maryland, Virginia, and Long Island are so similar that orchards of peaches were soon being planted in these regions, all of which were grouped in the "Peninsula peach belt." The first large peach orchard planted in Maryland for the fruit market was in Cecil County in 1830 by a Mr. Cassidy. He planted 50,000 trees and sent fruit to market in boats and wagons (Hedrick 1950:232).

Peaches need an adequate water supply during the growing season but are highly intolerant of poorly drained soil. A peach tree can be killed in a week or two if "its feet are wet" even in the spring (Yepsen 1976:27). Given the wet soil conditions of the site area it is unlikely that the peach pits recovered are from peaches grown on the site.

A total of three peach pits were recovered from the site area. Peach pits are hard, durable, and tend to survive in a variety of archeological contexts when other less durable floral material does not. Although there is no definitive quantitative model by which to ascertain how many peach pits would be expected on a site if a peach tree or orchard were present, it is likely that it would be more than three. Some fruit would fall to the ground as spoil and if grown on site would have been used more intensively. It is more likely that the peaches were purchased and brought to the site rather than grown on the site.

Twenty-eight percent of the total assemblage was composed of trees and shrubs, however 56% of the tree/shrub assemblage produced edible fruit.

Weeds and Vines

Woodbine or Virginia Creeper (*Parthenocissus quinquefolia*) is a woody vine common in a mixed mesophytic setting.

Greenbriar (*Smilax hispida*) is a shrubby vine which thrives in wet edges or borders of woods or thickets. It is a climbing vine supported by pairs of tendrils.

Today, jimsonweed (*Datura stramonium*) is found in fields, abandoned feed lots, barnyards, and waste areas. All parts of the plant are poisonous. The early settlers at Jamestown knew about the plant and its properties, thus the common name Jamestown Weed (Cox 1985). Jimsonweed is considered a weed by contemporary standards; however it was a popular ornamental as early as the 1600s. By the late 1700s other varieties of *Datura* replaced the *D. stramonium* in popularity (*Datura metal, Datura inoxia*). It is unlikely that by the mid-1800s, Jimsonweed continued to hold the status of an ornamental.

Ragweed (*Ambrosia trifida*) is noted for its allergy-inducing pollen and it is also an obnoxious farm weed. Ragweed often develops solid luxuriant stands in fields after a grain crop has been harvested (Martin 1972:130).

Hog peanut (*Amphicarpa bracteata*) is a perennial with subterranean seedpods. At maturity, aerial pods split and windborne dispersion takes place. Both aerial and underground seeds are eaten by grouse, quail, and pheasant. The common name suggests that the underground pods are sought after also by hogs. Hog peanut is a moist soil plant and is most common in woods and woodland borders, especially near streams. The seeds are high in protein and were well known to the American Indians. This plant was once cultivated for food in southeastern areas of the United States but there is no documentation that occurred in the East (Cox 1985:60).

Mayapple (*Podophyllum peltatum*) is a perennial herb with fibrous roots which grows to 18 inches high. May Apple often is found in dense stands in moist woods, forest margins, and roadsides. Mayapple favors the same soil and light conditions as Solomon's Seal and the two are often found growing adjacent to one another (Scott 1984:47). The ripe fruit has a slightly tart strawberry like flavor and the pulp can be eaten raw or made into jelly. Mayapple is described in Indian herbology as a remedy for gall bladder dysfunctions, kidney stones, constipation, and intestinal worms (Harris 1985:25; Cox 1985:46). The rootstalk as well as the leaves are poisonous, although the rhizomes do have cathartic properties. The rhizome contains a resin called podophyllin which has an effect on living tissue and is used in modern medicine in the treatment of warts (Cox 1985). There is no documentation that Mayapple was utilized in the 1800s.

Clover (*Trifolium sp.*) is a biennial introduced from Europe. Clover is a rich source of protein, calcium, and vitamins for all classes of livestock. It was widely cultivated as a forage plant. The dried leaves and flower clusters can be used to make a tea and the spring leaves can be added to salads or cooked as greens. The dried flowering plant was used in salves (Cox 1985). Clovers now inhabit a variety of environments from lawns to forests.

Thistle (*Cirsium sp.*) is a perennial with a creeping rhizome which was most likely introduced from Europe (of the 12 species of thistle in North America, only one is native). This is a troublesome weed and can be difficult to eradicate. If it is cut into pieces, each piece is capable of giving rise to a new plant. In autumn and through the winter, the fleshy root can be cooked. In the second year of growth the young leaves can be cooked like turnip greens. Thistle was used as a tonic and diuretic, and was boiled with milk as a treatment for dysentery (Cox 1985:155). It is found in cultivated fields, pastures, meadows, and waste areas. There is not substantial documentation that this was a utilized plant in the 1800s.

Knotweed (*Polygonum aviculare*) is a native plant which inhabits the banks of ponds, brooks, and other wet areas. Knotweed is generally found in stands by itself because it does not survive well in competition with other species (Cox 1985:246). The roasted seeds were used by the American Indian as a food and were ground for use as flour. The flour is somewhat similar to buckwheat flour. An infusion of the flowering plant was reportedly used as a substitute for quinine (Cox 1985:246).

Fifty-two percent of the floral assemblage was composed of weeds. Jimsonweed was represented by the recovery of 102 seeds which was the highest frequency of the entire assemblage (38%).

Site Patterning

Samples were analyzed from the privy, postholes, postmolds (most likely associated with a fence), a board mold, and planting holes. There are certain expectations in terms of seed recovery and patterning related to any domestic structure.

Privies provide an ideal environment for preservation of botanical specimens and it is not unusual to have the highest frequencies of specimens recovered from a privy. Small-seeded fruits such as strawberries, raspberries, blackberries, and blueberries can be consumed and pass through the digestive tract unharmed. It is quite common to find these fruits highly represented within privy contexts. Even though blackberry seeds were recovered elsewhere at the site, none were recovered from the privy. The Harford Furnace privy was somewhat disappointing in the sense that very little was recovered from this context. Jimsonweed, clover, and ragweed were the only recovered specimens. None of these is edible and therefore did not enter the privy via feces.

Postmolds and postholes often represent a fence line. A distinguishing characteristic of fences is that they become a roost for birds. Birds sit on fences and deposit seeds which have passed through their digestive systems unharmed. It is common to find tree seed, small fruit seed, as well as weed seed in these contexts. Indeed, that is the pattern at Harford Furnace. Tuliptree, hemlock, cherry, and hawthorn, as well as mustard, bedstraw, jimsonweed, and woodbine were recovered from these contexts.

Two samples were from planting holes. One of the samples contained no floral material at all (Feature 47) and the other (Feature 34) contained two May Apple seeds.

Feature 41 represented a board mold. The distinctive characteristic of this feature was the presence of charred mustard and butter and eggs.

Research Questions

Very little is known about domestic structures associated with industrial features. Did they operate in the same fashion as any other rural site whereby there are crops, flowers, fruit trees, or vegetables which would suggest something about the subsistence and economic strategies employed by the inhabitants? The primary and general goal of research was to ascertain floral patterning which might be suggestive of a particularized domestic lifestyle associated with an industrial cash economy.

It is assumed that the project area is a domestic site associated with the Harford Furnace. It is further assumed that the domestic structure was occupied by a tenant associated with the furnace.

Hypothesis: Full-time participation in a cash economy will limit an agricultural commitment.

Logic: If the industrial tenant spends x number of hours a day at the furnace performing expected duties, then there is little time and energy left to devote to agriculture, horticulture, and, in general, food procurement.

Data: Two millet seeds were the only agriculture specimens recovered from the site area. No other crop grains were recovered. Millet is characterized by its ability to tolerate poor soil drainage and survive in adverse conditions.

Hypothesis: Presence of low maintenance vegetables or fruits suggest a strategy to combine self-sufficiency with a cash dependence.

Logic: The tenant may have combined gardening activities with his industrial activities. Although the tenant may not have had the time or proper soil conditions to enable him to devote to major crops, he or she may have grown food items which required much less attention. Growing grains like corn or wheat require a full-time commitment whereas a garden plot of vegetables and herbs can easily be maintained by any and/or all members of the family. A vegetable garden supplements the diet and decreases the amount of food items which must be purchased.

Data: One curcurbit seed was recovered. Mustard, peppergrass, and dock seeds were recovered. Sixteen percent of the total assemblage are garden plants. The greens that were recovered are low maintenance and would provide a source of food perhaps not available at the company store.

It is of interest that there is a high frequency of patent medicine bottles recovered from the site. This might suggest that the occupants are relying less on home remedies concocted from cultivated or collected herbs and more on store-purchased medicines.

Twelve percent of the total assemblage was comprised of cherry and blackberry seeds. The presence of these specimens suggests utilization of surrounding wild resources.

Hypothesis: The presence of ornamentals suggests family composition and time allotted for non-essential activities.

Logic: Most domestic structures are decorated with flowers. When a stand of flowers is encountered in the woods a house foundation is most likely nearby. In fact sometimes the placement of the flowers can suggest orientation of the structure. Historically, the women of the household cared for the ornamentals (as well as kitchen garden and, many times, the crops).

Data: Only 5% of the assemblage could be classified as an ornamental. Butter and Eggs was recovered from under a board mold (Feature 41); bedstraw, and a few Solomon's Seal seeds were also recovered. Each of these plants has escaped cultivation and are now found in the wild state. They are all low maintenance plants. Day lilies and daffodils were noted to be currently present at the site although they were not represented within the recovered assemblage. These are also low-maintenance ornamentals.

Hypothesis: If given a choice, inhabitants will select environmental parameters favorable to their proposed task.

Logic: Clearly the environment sets conditions and parameters by which people must operate and limits the choices that can be made. Land that is inundated with water and generally unsuited for agriculture may reduce or preclude agricultural endeavors. If the land was only marginally suited for agriculture an even greater commitment would have been required from the site residents to make it a viable endeavor. Conversely, it is important to note that if the inhabitants derived their livelihood from a source beyond their land (i.e., Harford Furnace), then it was not critical to have prime agricultural land. The site would be valued for its proximity to the work place rather than agricultural potential.

Data: The vast majority of recovered specimens are opportunistic plant specimens which thrive in the soil and moisture conditions of the site area.

Summary

It is interesting that floral data can be informative by virtue of what is not present within the site area. While it is unlikely that a floral analysis can replicate the exact proportions of floral materials utilized and prioritized at a site, a seed, grain, or fruit that was intensively utilized or cultivated will most likely be recovered even if not in the appropriate proportion. If agriculture had been practiced at the site to any large degree, then supporting evidence should be present.

The lack of recovered agriculture seeds suggests that the site inhabitants were not committed to agricultural pursuits in a large scale manner. Two millet seeds were the only agricultural specimens recovered from the site area. No other crop grains were recovered. Millet is characterized by its ability to tolerate poor soil drainage and survive in adverse conditions.

The tenant may have combined gardening activities with industrial activities. Although the tenant may not have had the time or proper soil conditions to enable a commitment to major crops, the tenant may have grown food items which required much less attention. The greens that were recovered are low maintenance and would provide a source of food perhaps not available at the company store.

Although some of the herb seeds recovered were historically utilized medicinally, most had fallen into disuse by the mid to late 1800s. It is of interest that there is a high frequency of patent medicine bottles recovered from the site. This might suggest that the occupants are relying less on home remedies concocted from cultivated or collected herbs and more on store-purchased medicines.

The floral data do not suggest that the inhabitants derived their livelihood from the land. The floral data do not suggest that the inhabitants devoted much time or energy to other horticultural endeavors such as landscaping or cultivation of flower and/or vegetable gardens.

APPENDIX IX

FAUNAL REMAINS FROM HARFORD FURNACE

by David T. Clark

APPENDIX IX
FAUNAL REMAINS FROM HARFORD FURNACE

The following is a report on the analysis of the faunal remains from the Harford Furnace site (18HA148). The entire site collection consisted of 2048 bone, shell (egg), and scale (fish) fragments, which weighed 4818.8 grams. Five distinct assemblages were analyzed, and the material is presented in Tables 39-43 in the following sequence:

Plowzone samples	Table 39
Grab samples from plow disturbed contexts	Table 40
House features	Table 41
Miscellaneous site features	Table 42
Relict creek bed feature	Table 43

Each assemblage is discussed in detail and followed with an overview, where appropriate. General site conclusions are presented at the end of the report.

The mean ceramic dates for these contexts range from 1841 to 1857 but most of the faunal remains are dated between 1850 and 1855. These of course are mean dates. The overall site occupation ranges from 1830 to the 1880s.

Methods

The faunal remains were cleaned and placed in clear, plastic polybags prior to delivery to the Archeology Laboratory, Department of Anthropology, The Catholic University of America.

Initially, the assemblage was separated by provenience. Each bag of material was segregated into identified/unidentified specimens. The remains were then grouped by animal type (class, genus, species, etc.), and specific characteristics (element type, element portion, meat portion, physical condition, modifications, etc.) were recorded for each specimen. The results were then tabulated on standard data forms which were used to produce a final report. The segregated remains were placed in clear plastic bags with a provenience/faunal data label stapled inside.

The underlying method of analysis is, first, to consider each faunal specimen biologically. Any deviation from the "normal" biological condition (weathering, scavenging, human alteration, disease, etc.) is discussed and documented.

Identification of the remains was aided, in some instances, by use of a modern skeletal comparative collection maintained in the Archeology Lab. The interpretation of butchering patterns and meat portions was aided by data recovered from current fieldwork on farm community butchering practices (Clark 1985). Each assemblage is presented below by context with reference to standard animal meat cut/skeletal element figures (Figures 59 - 61).

Plowzone Samples

The faunal remains from 15 plowzone samples were analyzed and consisted of 1381 bone and shell fragments weighing 2576.0 grams (Table 39). Generally, the remains were poorly preserved. The assemblages were highly fragmented, which limited the number of identified specimens. A few samples were extensively deteriorated and many fragments exhibited longitudinal cracks, surface peeling, fungus pitting, and

Table 39. Faunal material from plowzone.

	Bos taurus	Sus scrofa	Ovis aries	Caprinae sp.	Equus sp.	Odocoileus virginianus	large mammal (unid.)	Felis rufus
cranium		11					3	
maxillae		1						
molar	2	14						
premolar	3	10		1				
canine		8						
incisor	1	5						
mandible	1(1)=2							
molar	8	34	1				3	
premolar	5	31					1	
canine		14						
incisor	1	10						
vertebrae		3					3	
rib	2	4		1				
sternum								
innominate		2						
clavicle								
scapula		2(3)=5						
humerus		6(1L)=7			1	(1)=1		1
ulna		3(1R)=4						
radius	1	3		1			3	
carpal	1	2					1	
metacarpal		6(2)=8					1	
phalanx		1		1				
femur	1(1)=2	3(3)[2]=8					(1)=1	
tibia	[1](2)=3	4		(1)=1				
patella								
fibula		4	1					
tarsal	1	7						
metatarsal		2			3			
phalanx								
unid. vertebrae							92	
unid. rib							187	
unid.innominate								
long bone frag							509(1)[1]=511	
long bone frag(bnt.)							9(1)[1]=11	
long bone frag(inc.)							101	
totals	32	202	2	5	4	1	918	1

KEY

(#) : number of cut or axed bones
[#] : number of sawn bones
(R or L): right or left element
=# : total number of a given element
frag : fragment
bnt. : burnt
inc. : incinerated

Table 39 (Continued).

	Felis domesticus	Sylvilagus sp.	medium mammal (unid.)	Sciurus carolenisis	Rattus sp.	Scalopus aquaticus	small mammals (unid.)
cranium	11				1		
maxillae							
molar	2	2					
premolar							
canine	1						
incisor							
mandible		(1L)=1		(1L)=1	2		1
molar	1						
premolar							
canine	1						
incisor							
vertebrae	30	1			2		
rib	5						
sternum	1						
innominate	2				2		
clavicle							
scapula							
humerus	1				1	1	
ulna	1					1	
radius							
carpal	2						
metacarpal	4						
phalanx					5(1L)=6		
femur	2			1	1		
tibia							
patella							
fibula	2						
tarsal	2						1
metatarsal							
phalanx							
coracoid							
carpometacarpus							
furculum							
tarsometatarsus							1
tibiotarsus							
carapace							
plastron							
unid. vertebrae			2				
unid. rib			1				
unid.innominate							
long bone frag							1
long bone frag(bnt.)							
long bone frag(inc.)							
totals	68	4	3	2	15	2	4

KEY

(#) :number of cut or axed bones
[#] :number of sawn bones
(R or L):right or left element
=# :total number of a given element
frag :fragment
bnt. :burnt
inc. :incinerated

Table 39 (Continued).

	Gallus gallus domesticus	Meleagris gallopavo	large Aves (unid.)	Aves sp. (unid.)	eggshell (unid.)	Terrapene carolina	Turtle sp. (unid.)
cranium							
maxillae							
molar							
premolar							
canine							
incisor							
mandible							
molar							
premolar							
canine							
incisor							
vertebrae		1					
rib	2						
sternum	2						
innominate							
clavicle							
scapula	4	1					
humerus	2(2R)(1L)=5			1			
ulna	4						
radius	1						
carpal							
metacarpal							
phalanx							
femur	5(1)=6						
tibia							
patella							
fibula							
tarsal							
metatarsal							
phalanx							
coracoid	2	1					
carpometacarpus	1						
furculum	1						
tarsometatarsus	4						
tibiotarsus	10						
carapace						2	1
plastron							
unid. vertebrae	2		1				
unid. rib							
unid.innominate							
long bone frag	1			20			
long bone frag(bnt.)							
long bone frag(inc.)							
eggshell					1		
totals	45	3	1	21	1	2	1

KEY

(#)	:number of cut or axed bones
[#]	:number of sawn bones
(R or L)	:right or left element
=#	:total number of a given element
frag	:fragment
bnt.	:burnt
inc.	:incinerated

Table 39 (Continued).

	Rana sp.	Selindea sp.	Ictalurus sp.	Perca flavescens	Pisces sp. (unid.)
cranium			1	2	
maxillae					
molar					
premolar					
canine					
incisor					
mandible				1	1
molar					
premolar					
canine					
incisor					
vertebrae					
rib					
sternum		1			
innominate		1			
clavicle					
scapula					
humerus	1				
ulna					
radius					
carpal					
metacarpal					
phalanx					
femur					
tibia					
patella					
fibula					
tarsal					
metatarsal					
phalanx					
unid. vertebrae					
unid. rib					
unid.innominate					
long bone frag					
long bone frag(bnt.)					
long bone frag(inc.)					
totals	1	2	1	3	1

KEY

(#) : number of cut or axed bones
[#] : number of sawn bones
(R or L): right or left element
=# : total number of a given element
frag : fragment
bnt. : burnt
inc. : incinerated

TABLE 40. Faunal remains grab sampled from mechanically removed plowzone.

	Bos taurus	Sus scrofa	Caprinae sp.	Equus sp.	large mammal (unid.)	Felis domesticus	Rattus sp.	Gallus gallus domesticus	Ictalurus sp.	Perca flavescens
cranium	3								3	1
maxillae						1				
molar										
premolar										
canine										
incisor		4								
mandible		5(1R)=6					(1R)=1			
molar	1	2		1						
premolar										
canine										
incisor	1	1					1			
vertebrae	Ī(1)=2		2			1				
rib	1	5								
sternum										
innominate			1			2				
clavicle										
scapula		(1)=1				1				
humerus		2[1]=3				1				
ulna										
radius	(1L)=1		2							
carpal	2									
metacarpal		2								
phalanx										
femur	1	2						1		
tibia	[1]=1	3(1)=4				1				
patella										
fibula										
tarsal				2						
metatarsal		1	1							
phalanx	3			1						
unid. vertebrae										
unid. rib										
unid.innominate										
long bone frag					14[1]=15					
long bone frag(bnt.)										
long bone frag(inc.)										
carpometacarpus								1		
tarsometatarsus								1		
totals	16	31	6	4	15	7	2	3	3	1 =88

KEY

(#) :number of cut or axed bones
[#] :number of sawn bones
(R or L):right or left element
=# :total number of a given element
frag :fragment
bnt. :burnt
inc. :incinerated

TABLE 41. Faunal remains from house features.

	F100 Sus scrofa	large mammal (unid.)	small mammal (unid.)	F101 Sus scrofa	large mammal (unid.)	Felis domesticus	Perca flavescens
cranium							2
maxillae			1				
molar							
premolar							
canine							
incisor							
mandible							
molar							
premolar							
canine							
incisor							
vertebrae							
rib							
sternum	1						
innominate							
clavicle							
scapula							
humerus				(1L)=1			
ulna							
radius							
carpal							
metacarpal							
phalanx							
femur							
tibia							
patella							
fibula							
tarsal							
metatarsal						1	
phalanx							
unid. vertebrae			1				
unid. rib							
unid.innominate							
long bone frag		2			1		
long bone frag(bnt.)							
long bone frag(inc.)					1		
totals	1	2	2 =5	1	2	1	2 =6

KEY

(#)	:	number of cut or axed bones
[#]	:	number of sawn bones
(R or L)	:	right or left element
=#	:	total number of a given element
frag	:	fragment
bnt.	:	burnt
inc.	:	incinerated

TABLE 41 (Continued).

	F103 large mammal (unid.)	Felis domesticus	Rattus sp.	Aves sp.	Pisces sp.	F104 Sus scrofa	large mammal (unid.)	Felis domesticus	Blarina brevicauda
cranium									
maxillae									
molar									
premolar									
canine									
incisor									
mandible			(1L)=1						(1L)=1
molar									
premolar									
canine									
incisor									
vertebrae		1			1				
rib		1							
sternum									
innominate									
clavicle									
scapula									
humerus						(1)=1			
ulna						1			
radius								1	
carpal									
metacarpal						1			
phalanx				1					
femur		(1R)=1							
tibia									
patella									
fibula									
tarsal									
metatarsal									
phalanx									
unid. vertebrae	3								
unid. rib									
unid.innominate									
long bone frag							2		
long bone frag(bnt.)									
long bone frag(inc.)									
totals	3	3	1	1	1 =9	3	2	1	1

KEY

(#)	:	number of cut or axed bones
[#]	:	number of sawn bones
(R or L)	:	right or left element
=#	:	total number of a given element
frag	:	fragment
bnt.	:	burnt
inc.	:	incinerated

TABLE 41 (Continued).

	F104 (cont.) Perca flavescens	F106 large mammal (unid.)	F108 Sus scrofa	large mammal (unid.)	Rattus sp.	Gallus gallus domesticus	eggshell
cranium	1					1	
maxillae							
molar							
premolar							
canine							
incisor							
mandible							
molar							
premolar							
canine							
incisor							
vertebrae	1					1	
rib							
sternum							
innominate							
clavicle							
scapula							
humerus					1		
ulna							
radius							
carpal			1				
metacarpal							
phalanx							
femur							
tibia							
patella							
fibula							
tarsal							
metatarsal							
phalanx							
unid. vertebrae							
unid. rib							
unid.innominate							
long bone frag				2			
long bone frag(bnt.)							
long bone frag(inc.)		1					
eggshell							1
totals	2 =9	1 =1	1	2	1	2	1 =7

KEY

(#) number of cut or axed bones
[#] number of sawn bones
(R or right or left element
=# total number of a given element
frag fragment
bnt. burnt
inc. incinerated

TABLE 41 (Continued).

	F109 Sus scrofa	large mammal (unid.)	egg shell	Pisces sp.	F110 Bos taurus	Sus scrofa	Gallus gallus domesticus
cranium		1		1			
maxillae							
molar							
premolar							
canine							
incisor							
mandible							
molar							
premolar							
canine							
incisor							
vertebrae							
rib					1		
sternum							
innominate							1
clavicle							
scapula						1	
humerus							
ulna							
radius							
carpal							
metacarpal							
phalanx	1						
femur							
tibia						1	
patella							
fibula							
tarsal							
metatarsal							
phalanx	1						
unid. vertebrae		1					
unid. rib		2					
unid.innominate							
long bone frag		2					
long bone frag(bnt.)							
long bone frag(inc.)		6					
tarsometatarsus							1
eggshell			2				
totals	1	12	2	1 =16	1	2	2 =5

KEY

(#)	:	number of cut or axed bones
[#]	:	number of sawn bones
(R or L)	:	right or left element
=#	:	total number of a given element
frag	:	fragment
bnt.	:	burnt
inc.	:	incinerated

TABLE 41 (Continued).

	F112 Sus scrofa	Gallus gallus domesticus	F113 eggshell	F117 Caprinae sp.	large mammal (unid.)	Felis domesticus
cranium						
maxillae						
molar						
premolar						
canine						
incisor						
mandible						
molar						
premolar						
canine						
incisor						
vertebrae						
rib	1			1		
sternum	(1)=1					
innominate						
clavicle						
scapula						
humerus		1				
ulna						
radius						
carpal						
metacarpal						2
phalanx						
femur						
tibia						1
patella						
fibula						1
tarsal						
metatarsal	1					
phalanx						
unid. vertebrae						
unid. rib						
unid.innominate						
long bone frag					4	
long bone frag(bnt.)						
long bone frag(inc.)						
tarsometatarsus						
eggshell			1			
totals	3	1 =4	1 =1	1	4	4

KEY

(#)	:	number of cut or axed bones
[#]	:	number of sawn bones
(R or L):		right or left element
=#	:	total number of a given element
frag	:	fragment
bnt.	:	burnt
inc.	:	incinerated

TABLE 41 (Continued).

	F117 (cont.) Gallus gallus domesticus	eggshell (unid.)	F118 Bos taurus	large mammal (unid.)	Felis domesticus	Gallus gallus domesticus
cranium						
maxillae						
molar						
premolar						
canine						
incisor						
mandible						
molar			1			
premolar						
canine						
incisor						
vertebrae					1	2
rib						
sternum						
innominate						
clavicle						
scapula						2
humerus	1					
ulna						
radius						1
carpal						
metacarpal						
phalanx						
femur						
tibia						
patella						
fibula						
tarsal						
metatarsal					1	
phalanx						
unid. vertebrae				5		
unid. rib						
unid.innominate						
long bone frag				4		
long bone frag(bnt.)						
long bone frag(inc.)						
eggshell		4				
totals	1	4 =14	1	9	2	5

KEY

(#)	: number of cut or axed bones
[#]	: number of sawn bones
(R or L)	: right or left element
=#	: total number of a given element
frag	: fragment
bnt.	: burnt
inc.	: incinerated

TABLE 41 (Continued).

	F118 (cont.) eggshell (unid.)	Pisces sp. (unid.)	F119 Sus scrofa	Equus sp.	large mammal (unid.)	Felis domesticus
cranium		2				
maxillae						
molar						
premolar						
canine			1			1
incisor						
mandible						
molar						
premolar						
canine						1
incisor						
vertebrae						6
rib		1	(1)=1	1		2
sternum						
innominate						1
clavicle						
scapula					(1)=1	
humerus			[1]=1			
ulna						
radius			[1]=1			
carpal						
metacarpal				1		
phalanx			1			
femur						
tibia						
patella						
fibula						
tarsal						1
metatarsal						
phalanx				1		
unid. vertebrae					6	
unid. rib						
unid.innominate						
long bone frag					19	
long bone frag(bnt.)						
long bone frag(inc.)					6	
eggshell	2					
totals	2	3 =22	6	3	32	14

KEY

(#) : number of cut or axed bones
[#] : number of sawn bones
(R or L): right or left element
=# : total number of a given element
frag : fragment
bnt. : burnt
inc. : incinerated

TABLE 41 (Continued).

	F119 (cont.) Syvilagus sp.	Rattus sp.	Aves sp.	eggshell (unid.)	Selindea sp.	Perca flavescens	Pisces sp. (unid.)
cranium		4	2			27	14
maxillae							
molar							
premolar							
canine							
incisor							
mandible							
molar							
premolar							
canine							
incisor							
vertebrae		4	1			3	4
rib							4
sternum							
innominate		1					
clavicle							
scapula							
humerus			1		1		
ulna							
radius							
carpal							
metacarpal							
phalanx							
femur							
tibia		1					
patella							
fibula							
tarsal							
metatarsal	3						
phalanx							
unid. vertebrae							
unid. rib							
unid.innominate							
long bone frag			3				
long bone frag(bnt.)							
long bone frag(inc.)							
scale						4	
eggshell				3			
totals	3	10	7	3	1	34	22 =135

KEY

(#)	number of cut or axed bones
[#]	number of sawn bones
(R or L)	right or left element
=#	total number of a given element
frag	fragment
bnt.	burnt
inc.	incinerated

TABLE 42. Faunal remains from miscellaneous features.

	Bos taurus	Sus scrofa	Caprinae sp.	Equus sp.	large mammal (unid.)	medium mammal (unid.)	Sciurus carolenisis	Gallus gallus domesticus
cranium		1			2		1	
maxillae								
molar								
premolar								
canine								
incisor								
mandible	1(1)=2	1		(1L)=1				
molar	4	6	1					
premolar	1	7						
canine								
incisor	1	6						
vertebrae		2		1				
rib	[2]=2	3						
sternum								
innominate								
clavicle								
scapula	[1R]=1							
humerus		2						
ulna		1	1					1
radius								
carpal								
metacarpal		4	1	1				
phalanx								
femur		2[1R]=3						
tibia	1							
patella								
fibula								
tarsal				1				
metatarsal								
phalanx				1				
unid. vertebrae					6			
unid. rib					13			
unid.innominate								
long bone frag					30	7		
long bone frag(bnt.)								
long bone frag(inc.)					64	4		
unidentified								
carapace								
scale								
totals	12	36	3	5	115	11	1	1

KEY

(#)	number of cut or axed bones
[#]	number of sawn bones
(R or L)	right or left element
=#	total number of a given element
frag	fragment
bnt.	burnt
inc.	incinerated

TABLE 42 (Continued).

	Meleagris gallopavo	Aves sp. (unid.)	Turtle sp. (unid.)	Perca flavescens	Pisces sp. (unid.)	
cranium						
maxillae						
molar						
premolar						
canine						
incisor						
mandible						
molar						
premolar						
canine						
incisor						
vertebrae	1				1	
rib						
sternum						
innominate						
clavicle						
scapula						
humerus						
ulna						
radius						
carpal						
metacarpal						
phalanx						
femur						
tibia						
patella						
fibula						
tarsal						
metatarsal						
phalanx						
unid. vertebrae						
unid. rib						
unid.innominate						
long bone frag		2				
long bone frag(bnt.)						
long bone frag(inc.)						
unidentified		32				
carapace			3			
scale				3		
totals	1	34	1	3	1	=224

KEY

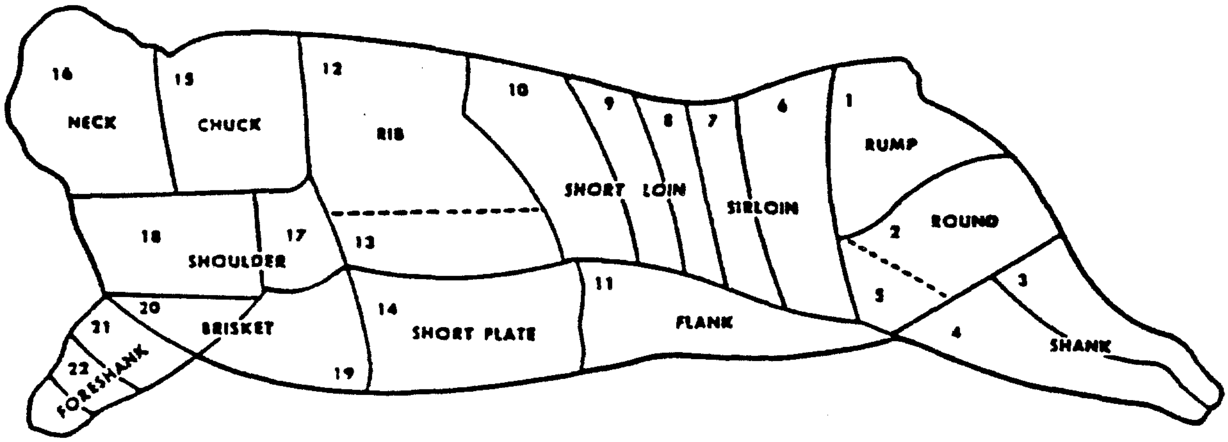
(#)	:	number of cut or axed bones
[#]	:	number of sawn bones
(R or L)	:	right or left element
=#	:	total number of a given element
frag	:	fragment
bnt.	:	burnt
inc.	:	incinerated

TABLE 43. Faunal remains from relict creek bed.

	Bos taurus	Sus scrofa	Ovis aries	Caprinae sp.	large mammal (unid.)	Syvilagus sp.
cranium		1				
maxillae						
molar						
premolar						
canine						
incisor						
mandible		1				
molar		1				
premolar		1				
canine						
incisor		1				
vertebrae	(1)=1					
rib					8(1)=9	
sternum						
innominate		2				[1]=1
clavicle						
scapula	1	(1R)=1				
humerus	(1L)=1	1	1			
ulna						
radius				1		
carpal						
metacarpal						
phalanx						
femur	1(1)[1R]=3					
tibia	1[1]=2	(1)=1				
patella						
fibula						
tarsal						
metatarsal						
phalanx						
unid. vertebrae					12	
unid. rib						
unid.innominate						
long bone frag					21	
long bone frag(bnt.)						
long bone frag(inc.)					57	
totals	8	10	1	1	100	1 =121

KEY

(#)	:	number of cut or axed bones
[#]	:	number of sawn bones
(R or L)	:	right or left element
=#	:	total number of a given element
frag	:	fragment
bnt.	:	burnt
inc.	:	incinerated



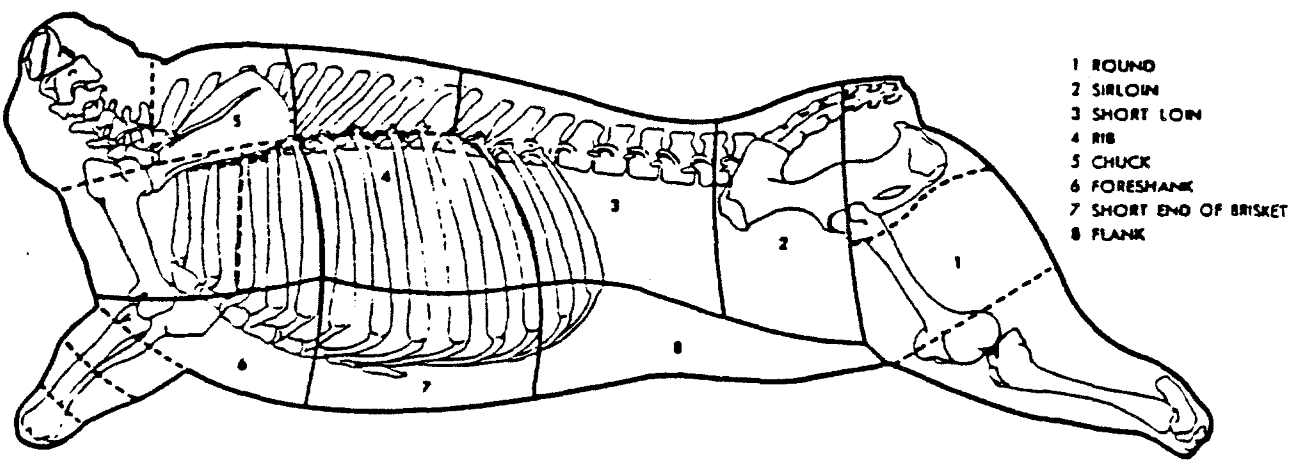
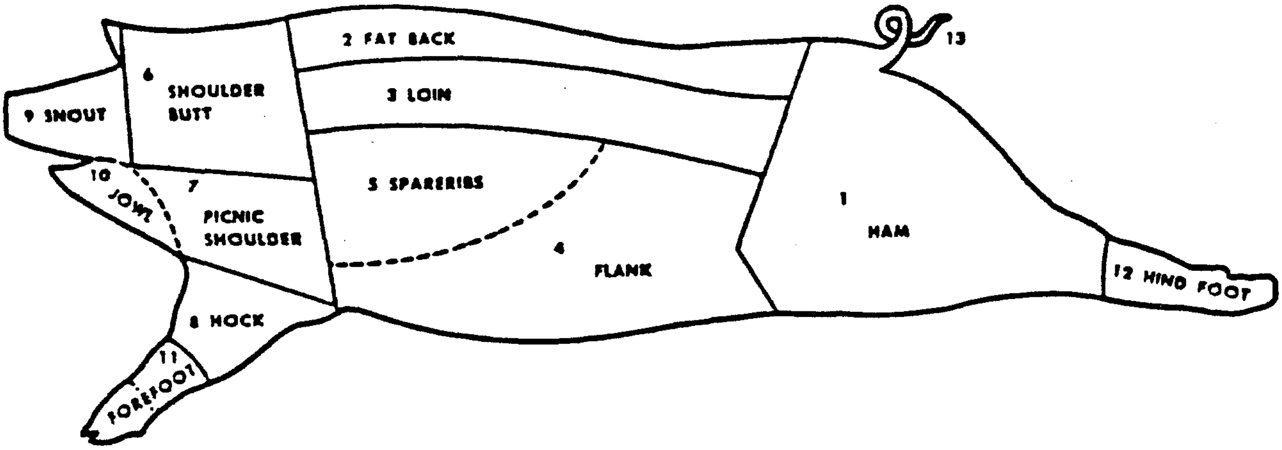


FIGURE 59. *Bos Taurus* (cow) meat portions.



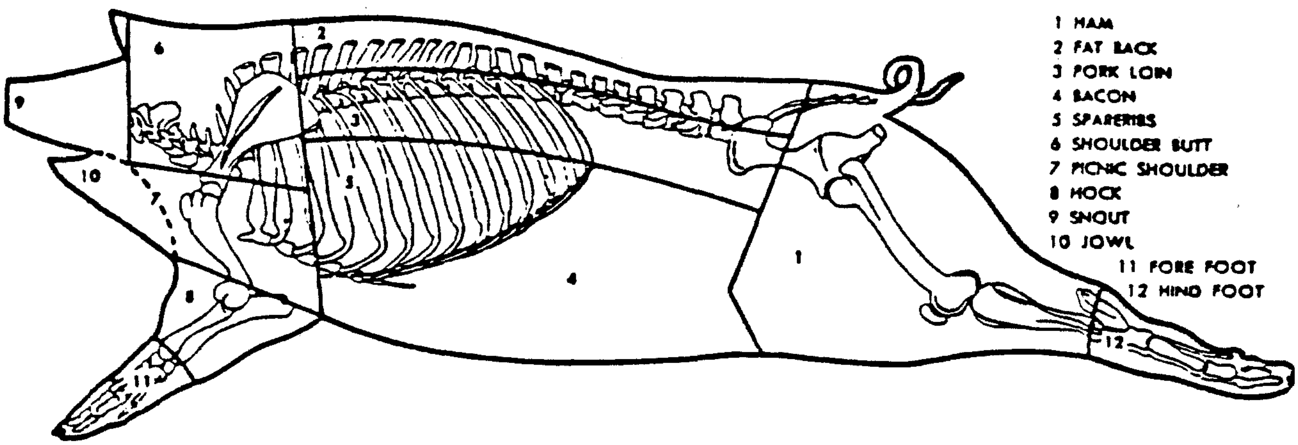


FIGURE 60. *Sus Scrota* **(pig) meat portions.**

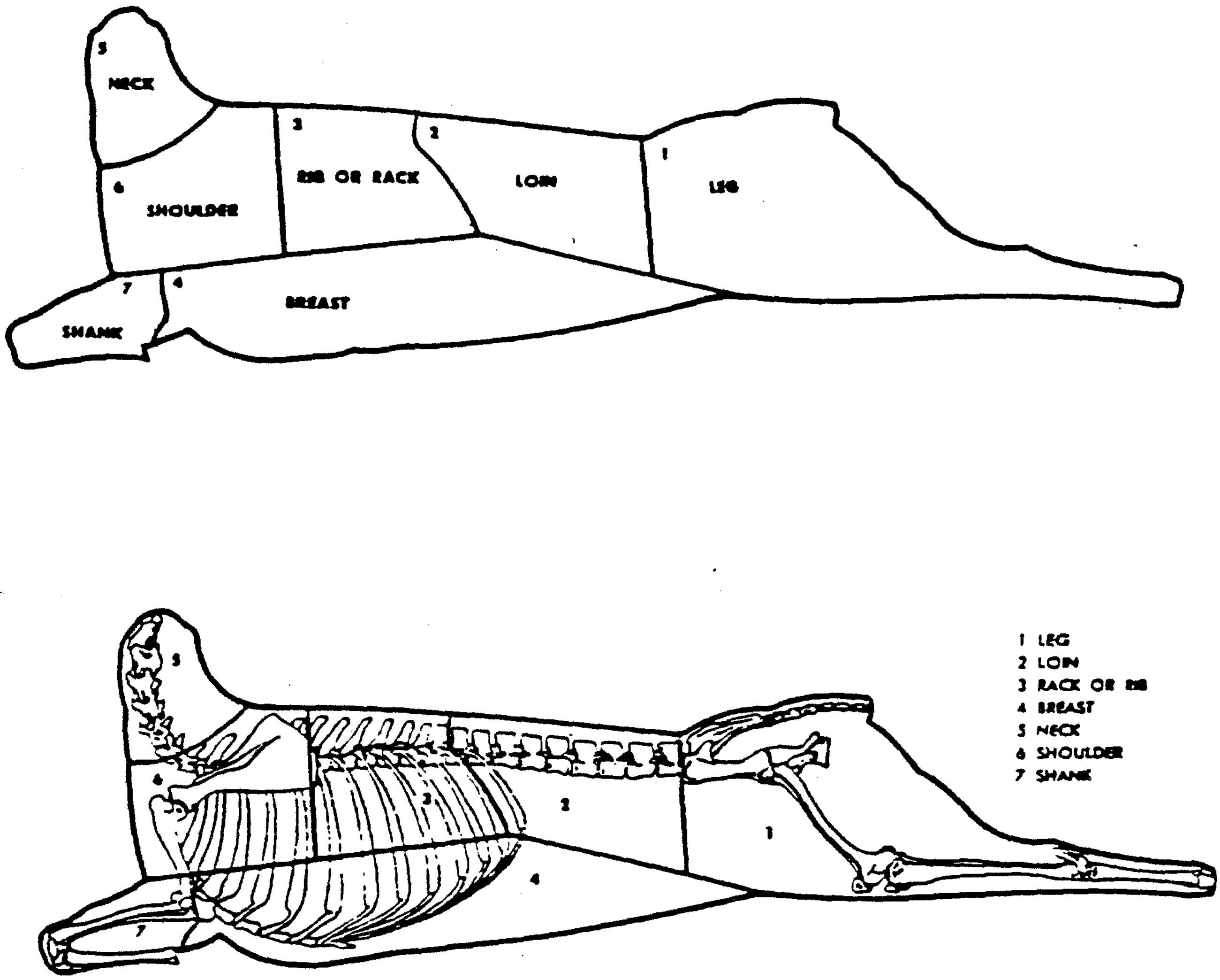


FIGURE 61. *Ovis Aries* (sheep) meat portions.

abrasions. This was the result of general weathering, adverse soil conditions, and prolonged waterlogging. A number of specimens were rodent gnawed, mostly the result of rat scavenging. Many fragments were burnt or incinerated from either food preparation or refuse burning.

Bos taurus (Cow)

In all, 32 cow bones and teeth were recovered from the plowzone samples (Table 39). These included 20 teeth and two mandible fragments, which probably represented butchering refuse as skull parts are usually discarded after initial processing of the animal. The maturation data from tooth wear and growth patterns indicated that one individual was 12-16 months at death. Two ribs are included in the assemblage which probably are related to either a standing-rib roast or a short plate cut (Figure 59). One radius would have come from a shank-knuckle meat portion, and the one carpal would indicate an ankle cut (Figure 59). One axe-cut femur and one femur without axe cutting represent round roast cuts while two axe-cut tibias represent a hind-shank cut as does one symmetrically sawn tibia (Figure 59). The one tarsal recovered suggests another ankle cut as did the carpal above.

Sus scrofa (Pig)

Pig remains represented the bulk of the identified specimens. Nearly 70% of these are teeth and cranial bones normally discarded during initial butchering. These are also very dense bones which tend to be better preserved in the ground. Two vertebrae, a phalanx, eight metacarpals, two metatarsals, two carpals, and seven tarsals were recovered which also probably relate to initial butchering waste. However, the metacarpals, the carpals, the metatarsals, and tarsals may represent "pigs feet." Two of the metatarsals had evidence of axe cutting. Four ribs included in the assemblage represent either loin roast meats or spareribs (Figure 60). Two innominate fragments would have been included in butt-half hams, six of the femur fragments would be either butt-half hams or shank-half hams, and the two symmetrically sawn femur fragments would represent ham steaks or specialty ham roasts. Two of the previously mentioned six femur fragments had been axe-cut. One of the four tibia fragments recovered was symmetrically sawn and represents a specialty meat cut while the remaining three would have been included in shank-half hams as would the four fibulas recovered. The five scapulas, seven humeri, and three radii would have been parts of a picnic-shoulder meat portions. The four ulna fragments should represent shoulder-hock meats. The maturation data from tooth wear and growth patterns indicate one individual less than six months old, two approximately 9 to 10 months, 14 less than or approximately a year, and two greater than two years old at death.

Ovis aries (Sheep)

Only two sheep bones were present in the plowzone assemblage. These were a single sheep molar with a wear pattern indicating an age of at least 14 months and one sheep tibia. The tibia (lower hind leg) represents a "leg of lamb" portion (Figure 61).

Caprinae (Sheep-Goat)

One poorly preserved molar, one very fragmentary rib, a deteriorated, cut tibia, a fragmentary radius, and a decayed phalanx were recovered that could be from either sheep or goats. The cut tibia represents a leg portion of some type. However, all the specimens were too highly decayed for in-depth analysis.

Equus sp. (Horses and Mules)

Four horse or mule bones are represented in the collection. These include one humerus and three metatarsals. Historical records indicate that mules were commonly used as draft animals at the furnace.

Odocoileus virginianus (White-tailed Deer)

A deer humerus (upper foreleg) fragment was identified, representing the only bone fragment from a large wild species in the entire Harford Furnace faunal collection. The white-tailed deer is one of the most prevalent game animals in eastern North America. Primarily, a nocturnal browser, it prefers a variety of open field, woodland, and forest habitats with sufficient vegetation for food and shelter.

Large mammal (unidentified)

This group represented the bulk of the assemblage consisting mostly of leg bone fragments but also a number of ribs and vertebrae and also a lesser number of other elements. Several specimens exhibited rat gnaw marks and a few were sawed. One specimen, from a thick leg shaft fragment, was extensively worked and, apparently, part of a tool handle. A number of vertebrae, ribs, and leg bone fragments were burnt or incinerated due either to food preparation or refuse burning.

Felis domesticus (Domestic Cat)

Sixty-eight cat bones were recovered in the plowzone samples and included almost the entire range of osteological elements. Most of one individual was recovered which probably represents a cat burial. Common to many domestic areas, the house cat was a prevalent scavenger, rodent predator, and pet.

Felis rufus (Bobcat)

One bobcat humerus fragment was identified. Remains of this species are extremely rare in most assemblages. It inhabits a wide range of environments including areas of broken countryside with adequate underbrush cover, mountainous regions, open woodland, disturbed fields, fringe-open farmland, and swampy habitats. Chiefly nocturnal and carnivorous, the bobcat eats a variety of foods, especially mice-to opossum-size mammals, and to a lesser extent birds, snakes, insects, and carrion.

Syvilagus sp. (Rabbit)

Four rabbit bones were identified in the assemblage of material from the plowzone. These included two molars, one mandible, and one vertebrae. Rabbits are common throughout the eastern woodlands and are popular game animals. They prefer open field and woodland fringe habitats common in the site area.

Medium mammals (unidentified)

Four bones are grouped here that were too fragmentary for further analysis.

Sciurus carolinensis (Gray Squirrel)

Although represented by only one leg bone fragment and one mandible, the gray squirrel is a common woodland species and game animal.

Rattus sp. (Rat)

Rat bones were relatively common and included skull, mandible, vertebrae, innominate (pelvis), and leg bone fragments. Rats are notorious scavengers and, given the appropriate circumstances, will systematically scavenge refuse material, contributing significantly to the destruction of bone remains. A variety of mammal and bird bones were gnawed, both on joint surfaces and around ligament attachments.

Tamias striatus (Chipmunk)

One pelvis fragment of a chipmunk was recovered. The species is common across the eastern U.S. and is found in open field and woodland habitats.

Scalopus aquaticus (Eastern Mole)

One humerus and one ulna were present. These specimens were well preserved and are probably intrusive. Moles are burrowing insectivores and are common in the site area.

Small mammals (unidentified)

Three bones are grouped here that were too fragmentary for further analysis.

Gallus gallus domesticus (chicken)

Chicken remains (45) were abundant and included innominate, wing, shoulder, leg, toe bones, and other elements. Major meats were wings, backs, and thighs. The presence of meatless elements such as lower leg bones and extremities (toe, tail bones) indicated that chickens were butchered in the site area. Rat gnawing was observed on two limbs and was confined to areas of ligament attachments.

Meleagris gallopavo (Turkey)

Three turkey elements were present and represented back and wing meats. Though not as common as chicken, turkey was probably an important secondary food species. One upper wing bone was rat-gnawed around the joint surface.

Large Aves (unidentified), Aves sp. (unidentified), and Eggshell

Other bird remains consisted of unidentified leg bone fragments and eggshells.

Rana sp. (Frog)

A single frog bone fragment was identified. Frogs occupy a variety of well-watered or moist habitats, which undoubtedly existed at or near the site.

Selinedae (Frog-Toad)

This group included two, poorly preserved, bone fragments. Both toad and frog species are prevalent in the site area.

Terrapene carolina (Eastern Box Turtle)

Box turtle remains included two carapace (upper shell) fragments. This terrestrial species is common throughout the eastern woodlands and prefers moist open field and wooded habitats.

Turtle sp. (unidentified)

One turtle carapace fragment was too deteriorated for further identification.

Ictalurus sp. (Catfish)

One catfish cranial element was recorded. Catfish are very common to many freshwater and estuarine environments, and represent a popular food fish.

Perca flavescens (Yellow Perch)

This material included two cranial fragments and one mandible. The yellow perch is a common freshwater species and a popular game fish. Another unidentified fish bone was recorded, representing a dentary fragment.

Overview: Plowzone Contexts

The faunal remains from plowzone contexts from the Harford Furnace site included 1381 bone and shell fragments and weighed 2477.0 grams. Upon comparison, the plowzone samples shared a number of similarities with few significant differences. There was a similarity in the overall distribution of common species and skeletal elements as well as in the evidence for butchering practices.

In many cases, the frequency and distribution of skeletal elements, as well as species identification, depended on the condition of the remains. All samples were highly fragmented, which limited the identification of individual specimens. Typically, teeth and other thick, dense, weather resistant elements (ankle and toe bones) were identified at the genus-species level, whereas others, including leg bone fragments and to a lesser extent those of ribs and vertebrae, were too shattered and deteriorated for specific identification. Less than 25% of the remains in most assemblages were identified due to poor preservation.

Nineteen species were identified in the assemblage. Large mammal remains were dominant in every sample, but most specimens were unidentified. Cow and pig were the most commonly identified species and pig was prevalent in nearly every sample and represented the single most important meat species. Other large mammal remains, such as those of *Caprinae* (Sheep-Goat) and *Equus* (Horse-Mule), were scarce and too fragmented and deteriorated for specific identification. Sheep was recorded in two samples and historic documents indicate that mule was in common use at the site (Silas Hurry, personal communication 1986). Large, wild mammal remains were rare and included only one white-tailed deer fragment.

Smaller size domestic mammals such as cat and rat were relatively rare. Cat remains include the remains of one complete skeleton, possibly a cat burial. Rat remains were scarce but were recorded with many rat-gnawed bone fragments. Nearly all the gnaw marks matched the pattern of rat incisors. Rat scavenging was systematic, centering around bone joints and areas of ligament attachments. Often, entire joints were destroyed from extensive rat scavenging.

Chicken was the most prevalent bird species. This species was undoubtedly an important secondary food species.

Wild animal remains were comparatively scarce and include small species such as rabbit, squirrel, box turtle, and yellow perch. Most are popular game species and probably represented important secondary food resources. The remains of other wild species, like the mole, were well preserved and probably intrusive.

In general, the most common faunal remains (large mammals) represented food refuse of meat portions and to a lesser extent butchering refuse from initial disarticulation and bulk meat processing. As noted above, the common large mammal remains were leg fragments representing the meatiest portions of the animal. Common pig remains were from shoulder and leg elements, representing standard meats including shoulder-hock, picnic-shoulder, and butt and shank-half hams. Interestingly enough, other pig remains were symmetrically sawed portions representing specialty meats such as blade-loin and center-cut ham steaks. The prevalence of symmetrically sawed pig remains is indicative of systematic butchering practices more common by the mid 1800s. Though less common, cow remains also represented standard, bulk meat portions, especially rump-round and shank cuts.

Certain pig, cow, and chicken elements represented the remains from on-site butchering or discarded butchering refuse. Especially prevalent were teeth, cranial fragments, and certain limb extremities (toe and ankle bones) representing non-meaty body parts usually discarded during initial butchering and/or meat processing.

Maturation data varied between major species. The evidence indicated that most pigs were less than a year old at butchering, a time when the meat is very tender. However, a few were two years old or more at death and probably represent "breeding" stock. Cows were usually much older than pigs, at least two years or more, probably the result of longer development periods and the fact that cows were often used as draft or dairy animals for long periods of time. Sheep remains were less common but the available data revealed that most individuals were at least a year old at death.

Although the faunal remains were fragmented and often poorly preserved, the analysis yielded a wealth of valuable information especially regarding species distribution, frequency and distribution of elements and meat portions, and butchering practices.

Grab Samples from Plow Disturbed Contexts

This faunal assemblage is made up of material grab sampled from the plowzone in the course of mechanical excavation. The collection included 88 bone fragments weighing 503.5 grams (Table 40).

Breakage was minimal and large bone fragments as well as nearly complete elements were common. A number of fragments exhibited rust discoloration and small pieces of iron were affixed to the surfaces of many specimens. As stressed elsewhere, rusting metal is corrosive to bone materials, often leaving deep pits where the outer bone has been eroded.

A number of specimens were rodent gnawed and the tooth marks were similar to those of rat incisors. Not unexpectedly, a number of rat bones were identified in the assemblage.

Large mammal remains accounted for 82% of the collection and large domestic species were most commonly identified (Table 44).

TABLE 44. Distribution of faunal remains from grab sampled plowzone context.

	Number of Specimens	Number of Species
Mammals (large)	72	3
Mammals (other)	9	2
Aves	3	1
Pisces	4	2
Totals:	88	8

As shown, eight species were recognized from 88 fragments which attests to the quality of preservation. The entire assemblage is discussed in detail below.

Bos taurus (cow)

Cow remains (n=16) consisted of cranial (5) and post-cranial (11) refuse. Cranial elements included horn and tooth fragments, which probably represent initial butchering refuse. Most post-cranial remains consisted of vertebrae and leg bone fragments. One vertebra was split, the result of initial butchering where the spine is split lengthwise creating two equal halves of the carcass from which bulk meat portions are processed. Leg remains included a radius (lower foreleg) shaft from a foreshank cut, a femur (upper hind leg) shaft from a round roast portion, and a symmetrically sawed tibia (lower hind leg) section representing a thick shank steak or roast (Figure 59). Other elements were toe bones probably from discarded butchering refuse. Maturation data was unavailable due to bone deterioration.

Scrofa (pig)

As usual, pig remains (n=31) were most prevalent and included both cranial and post-cranial fragments. Cranial remains were teeth and mandible fragments. One mandible was cut perpendicular to the length of the element, the result of initial butchering where meat is removed from around the jaw that is then discarded. Common post-cranial elements were ribs and fore and hind limb bones. Five rib fragments were present from either spareribs or rib-loin roasts (Figure 60). One cut scapula (shoulder blade) joint represented a picnic-shoulder cut. Foreleg remains included three humerus (upper foreleg) fragments: two specimens were from picnic-shoulder meats, the other represented a shoulder-hock cut. One of these was sawed and the wavy saw pattern indicated the shaft was partially cut with a hand-saw and then snapped off, which is a typical initial meat processing technique. Hind leg specimens were most prevalent. Two femur joint (upper hind leg) fragments represented butt-half hams and four tibia (lower hind leg) pieces (one of which was cut) were from shank-half hams and a hind foot cut. Several limb extremities were present and represented either foot meats (pig's feet) or discarded refuse from initial butcherings.

A number of fragments were rat gnawed, consisting of systematic gnawing around joints and on shafts near fractures and areas of ligament attachments. The end of one rib fragment exhibited tooth gnaw marks from a dog-size carnivore.

Other fragments exhibited rust discoloration and corrosive pitting from contact with iron materials. One additional fragment (rib) was stained green probably from contact with deteriorating copper metal or minerals.

Sus remains yielded maturation data mostly from bone fusion patterns. The evidence revealed that one individual was less than a year old and another was more than 2 years old at death, suggesting that young tender hogs as well as older breeding stock were represented in the assemblage.

Caprinae (Sheep-Goat)

Sheep or goat could not be distinguished due to the deteriorated condition of the bone specimens. Six fragments were recorded including vertebrae (2), innominate (1), and leg bone (3) fragments. One specimen was rat gnawed along the shaft near points where ligaments attach.

Equus sp. (Horse-Mule)

Equus remains (n=4) were too deteriorated for specific identification and included one tooth fragment and three limb extremities: two ankle and one toe elements. Historic documents indicate that mules were prevalent at the site.

Large mammal (unidentified)

Fifteen unidentified large mammal bone fragments were recorded, all of which were leg bone fragments. One specimen was sawed and another was rat gnawed. Many of these specimens probably represented large domestic mammals, especially since large wild species were not identified.

Felis domesticus (House Cat)

Cat remains (n=7) were relatively common and included skull, vertebrae, innominate (pelvis), shoulder, and leg bone fragments.

Rattus sp. (Rat)

Only two rat fragments were uncovered, but rat-gnawed bones were common in the assemblage. Rat scavenging is systematic, usually confined to joints and shafts where gnawing is centered around the remains of ligaments, cartilage, gristle, and meat from discarded bone refuse.

Gallus gallus domesticus (Chicken)

Three chicken bones were present. These represent wing and leg fragments from wing and leg meats. This barnyard species was probably an important secondary food resource.

Ictalurus sp. (Catfish)

Three cranial catfish fragments were identified. A common bottom feeder, this species is ubiquitous in most freshwater and estuarine habitats. The catfish is a popular food species, which is often identified in faunal assemblages.

Perca flavescens (Yellow Perch)

A popular game fish, one element was identified for this species. Like the catfish, the yellow perch occupies a wide range of freshwater and esturaine habitats and was probably caught nearby.

Overview: Grab Sample From Plow Disturbed Contexts

Since this material was recovered in a non-systematic manner from plow disturbed soils, it should be viewed as supportive data to the general pattern derived from the foregoing plowzone discussion. Given that the recovery was non-systematic, the material has been kept separate to avoid biasing the rest of the plowzone sample.

Eight species were identified and large mammal fragments accounted for 82% of the remains. Large domestic mammals, especially pig and cow, were most often identified. Chicken probably represented an important secondary food species. Wild animal remains were scarce and only small game species were identified such as catfish and perch.

Maturation data was only available for pig remains. The evidence indicated that one individual was less than a year old, and another was more than two years old at death. Pig meat is most tender when the animal is less than a year old. Older animals probably represented breeding stock.

In general, the pattern of material from the grab sample is quite similar to the overall plowzone sample. Pig is the dominant mammal remain, followed by cow. Represented wild species are limited to fish.

House Features

The faunal assemblages from 13 house (construction and demolition) features were in many cases small and thus of limited value (Table 41). The entire assemblage consisted of 234 bone, shell, and scale fragments, which weighed 382.4 grams.

As expected for demolition and construction deposits, the faunal remains were highly fragmented, but otherwise in fairly good condition. A few specimens exhibited lengthwise cracks, fungus pitting, and abrasions. Specimens in most features were rat-gnawed, which was not surprising considering the high number of assemblages with rat remains.

A few specimens exhibited greenish discolorations probably from contact with copper materials or other minerals in the refuse. Some specimens were burnt or incinerated, the result of either food preparation or refuse burning. The assemblages are presented in detail below.

Feature 100

Five elements were present and weighed 22.0 grams. Pig (*Sus scrofa*) was the only species identified and was represented by one sternum (chest) fragment. Other specimens included unidentified large mammal bones.

Feature 101

This assemblage consisted of six fragments, which weighed 35.7 grams. One cut pig (*Sus scrofa*) humerus (upper foreleg) shaft was identified, representing a picnic-shoulder cut (Figure 60). This fragment exhibited rat-gnawing along the shaft near areas of ligament fusion. One cat (*Felis domesticus*) fragment was identified, as well as two yellow perch (*Perca flavescens*) cranial elements. This species is a very popular game fish and is common in most freshwater and estuarine habitats. Other remains were large mammal leg bone fragments (n=2).

Feature 103

Nine large mammal bone fragments were present and weighed 13.3 grams. House cat (*Felis domesticus*), rat (*Rattus sp.*), bird, and fish remains were also recorded, but in small numbers. Three unidentified large mammal vertebrae fragments exhibited rat-gnawing marks.

Feature 104

This feature yielded nine bone fragments weighing 27.8 grams. Four species were identified. Three pig (*Sus scrofa*) elements were recorded including a cut humerus (upper foreleg) and one ulna (lower foreleg) shaft, representing picnic-shoulder and shoulder-hock meats, respectively, and a foot bone from either discarded butchering refuse or a pig's feet meat portion (Figure 60). House cat (*Felis domesticus*) bones were recorded as well as a mandible from a short-tailed shrew (*Blarina brevicauda*). This insectivore is one of the most common small mammal species in the eastern United States. Occupying a wide range of habitats, it prefers moist areas along and under the ground but is often found in small spaces of building foundations and walls. Two yellow perch (*Perca flavescens*) elements were present. This species is a popular game fish represented in many other assemblages from the site, reflecting its importance as a secondary food resource.

Feature 106

This feature yielded only one unidentified large mammal bone fragment (2.6 grams) that was incinerated.

Feature 108

Six bone fragments, weighing 11.9 grams, were recorded. One pig (*Sus scrofa*) toe bone was recorded; these are usually removed and discarded during initial butchering. Other mammal remains included rat (n=1) and unidentified large mammal leg bone fragments (n=2). Chicken (*Gallus gallus domesticus*) remains included vertebrae and skull fragments, which are usually discarded during initial butchering. Bird eggshell fragments were also present.

Feature 109

This collection consisted of 16 fragments weighing 43.2 grams, and most (n=12) were unidentified large mammal bone fragments. One pig (*Sus scrofa*) phalanx (toe) was recorded, representing an element often removed and discarded during initial butchering. Additional remains were two bird eggshell fragments and one fish cranial element.

Feature 110

Only five bone fragments were identified, which weighed 16.7 grams and represented three species: a cow (*Bos taurus*) rib; two pig (*Sus scrofa*) fragments including a scapula (shoulder) fragment from a Boston-butt cut and a tibia (lower hind leg) shaft representing a shank-half ham (Figure 60); and two chicken (*Gallus gallus domesticus*) elements, including an innominate (thigh portion) and a lower leg bone representing butchering refuse.

Feature 112

Only four bone fragments weighing 9.1 grams were recorded for Feature 112. Three pig (*Sus scrofa*) bone fragments, including a vertebra, a cut rib joint, and one rat-gnawed foot bone were present, and represented a butt-half ham, rib-loin, and possibly pig's feet meat portions, respectively (Figure 60). One chicken (*Gallus gallus domesticus*) humerus (upper wing) represented a wing meat portion.

Feature 113

One bird eggshell fragment weighing 1.4 grams was identified.

Feature 117

This collection consisted of 14 bone and shell fragments weighing 26.2 grams. Large mammal remains included four unidentified bone specimens and one sheep or goat (*Caprinae*) rib fragment. Four cat (*Felis domesticus*) bones, all leg fragments, were identified. One specimen exhibited rat-gnawing along the shaft. In addition, a rat-gnawed chicken (*Gallus gallus domesticus*) humerus from a wing portion was identified. The scavenging was confined to the joint end of the humerus. Four bird eggshell fragments were also present.

Feature 118

Twenty-two bone and shell fragments weighing 39.6 grams were present. One cow (*Bos taurus*) molar fragment and nine other unidentified large mammal bone fragments were recorded as well as two cat elements. Chicken remains included back (scapula) and wing (radius) portions. Two bird eggshell fragments and three fish bones were also present.

Feature 119

This was the largest of the house features consisting of 135 fragments weighing 132.9 grams. The material was well preserved, especially small delicate elements, which resulted in a wide variety of identified animals (Table 45).

TABLE 45. Distribution of faunal remains from Feature 119.

	Number of Specimens	Number of Species
Mammals (large)	41	2
Mammals (other)	27	3
Aves	10	
Amphibia	1	
Pisces	56	1
Totals:	135	6

The data show considerable variation of skeletal elements and animal groups. The preservation of delicate fish cranial elements attested to the quality of preservation. The assemblage is described below in detail.

Six pig bones were present and all but one were post-cranial fragments (Table 41). They included one cut rib from a sparerib portion, and symmetrically sawed humerus (upper foreleg) and radius (lower foreleg) bone sections from specialty, arm steak meats (Figure 60). Two toe bones were also identified and represent initial butchering refuse.

Rat gnaw marks were observed on five specimens and most were confined to the outside edges of cut and sawed fragments. Since most of the specimens were cut or sawed, maturation data was unavailable.

Three specimens, one rib and two foot bone fragments of horse or mule, were present but were too fragmented for specific identification. However, mules were reportedly in common use as draft animals at the site.

Twenty-six fragments of large unidentified mammals were recorded and most were from limb bones. A third were rat-gnawed along shaft margins.

Cat remains (n=14) included teeth, vertebrae, innominate (pelvis), and limb bones. As scavengers, pets, etc., cat remains are common in many of the house features.

Three rabbit foot bones were present. Rabbits are popular game animals and their remains, though small in number, were identified in many assemblages from the site. There was no evidence of domestication.

Rat refuse (n=10) was relatively common which coincides with a high number of rat-gnawed bones. Curiously, all scavenged specimens were from large mammals and the systematic gnawing, as usual, was centered around joints and shafts in areas of ligament and muscle attachments.

Seven bird limb bone fragments and three eggshell pieces were recorded in this feature.

One humerus (upper foreleg) fragment of a frog or toad was identified, representing the only amphibian element from the house features.

Perch remains were very prevalent and represent the largest concentration of this species from the entire site. This material consisted of well preserved scales (n=4), vertebrae (n=3), and cranial (n=27) elements, representing, mostly, butchering refuse. The yellow perch is a popular game species, and considering the high number of bones recovered, it was probably caught nearby. This species represented an important food resource, especially since the remains were found in the house refuse deposits.

Unidentified fish bones (n=22) were also common and represented cranial, vertebra and rib elements. Many were perch-sized, but too deteriorated for accurate identification.

Overview: House Features

The entire faunal assemblage from the house features consisted of only 234 bone, shell, and scale fragments which were surprisingly well preserved, especially having been recovered from demolition and construction deposits. Though many were small (less than 10 specimens), the samples were generally similar in element and species distribution. Most included large mammal remains as well as preserved elements of smaller species such as cat, rat, rabbit, shrew, chicken, and fish. A variety of species, elements, and meat portions were recorded for Feature 119, which was the largest (135 specimens) of all the feature samples.

Similar to the evidence of other assemblages from the Harford Furnace site, large mammal remains were not abundant, representing a variety of domestic species: pig, cow, sheep-goat, and horse-mule. As usual, pig remains were most abundant, accounting for 75% of the identified large domestic mammal specimens. Other mammals commonly identified were domestic cat and rat. Chicken was the only bird species recorded but represented an important food resource. Wild animal remains were from small species including rabbit, shrew, and especially fish.

The distribution of bone remains varied between different species. The remains of both food refuse (elements associated with major meat portions) and butchering refuse (such as limb extremities, teeth, and cranial fragments) were represented in the assemblages. Pig remains included shoulder and leg elements representing mostly standard bulk meat portions such as picnic-shoulder and hams. The pig remains from Feature 119 also included symmetrically sawed specialty meats such as arm steaks and rib-loin roasts (Figure 60). Symmetrically sawed pig meats represent systematic butchering technology more common by the mid 1800s.

Chicken was another important food species identified in many assemblages. Common elements were from wings and legs representing wing, thigh, and leg meats. Certain chicken and pig bones, such as limb extremities, teeth, and cranial fragments, represent initial butchering refuse which indicates on-site butchering practices.

Fish were an important food resource. Perch elements were recorded in many assemblages as well as a host of unidentified fragments. Most of the fish remains were cranial and scale fragments which represents discarded butchering refuse from initial, on-site, meat processing. Yellow perch is a popular game species which occupies a variety of freshwater and estuarine habitats. Considering the abundance of perch remains, the species was probably caught nearby.

Overall the evidence indicates that large domestic mammals, especially pig, were major meat resources supplemented by chicken, fish, and possibly rabbit. Animals were butchered and processed at the site and both standard as well as specialty meat portions were consumed.

Miscellaneous Features

Forty miscellaneous feature samples were studied but all were small, ranging in size from one to 32 fragments. The total count for all the assemblages was only 224 specimens (Table 42). The material was poorly preserved and characterized by small fragments with longitudinal cracks, fungus pitting, surface peeling of outer layers, and discoloration (green, etc.). The majority of the deterioration was apparently due to general subsurface weathering (wet-dry cycles), adverse soil chemistry, periodic waterlogging, and association with other refuse (metal). The degree of deterioration resulted in a low number of identified fragments, most of which were from teeth or other weather resistant elements. Consequently, identified species were also limited.

Considering the very small size of individual feature samples, the poor preservation of the remains, and that few specimens were identified to the genus/species level, all the features were analyzed as a unit. The distribution of the remains shows the bulk from large mammals (Table 46). The majority of identified specimens were from large domestic mammals (Table 42). The entire assemblage is *presented in detail below.*

TABLE 46. Distribution of faunal remains from miscellaneous features.

	Number of Specimens	Number of Species
Mammalia	183	4
Mammalia (large)	171	
Aves	36	2
Reptilia	1	
Pisces	4	1
Totals:	224	7

Bos taurus (Cow)

Twelve fragments were identified including eight cranial and four post-cranial remains. Broken teeth were common (n=6) with two mandible (jaw) fragments, one of which exhibited fine cut marks across one side. Jaws and teeth are not associated with meaty body parts and were usually discarded during initial butchering when the carcass was disarticulated and divided in bulk meat portions. As noted, teeth were especially common because they represent dense elements which are more resistant to diverse, long-term weathering conditions.

Post-cranial remains included rib, shoulder and hind leg fragments. Three of these were symmetrically sawed: a symmetrically sawed section of a scapula (shoulder blade) joint, probably from a rolled shoulder roast or arm steak, and two sawed rib shaft sections from short ribs or short-plate roast (Figure 59). An uncut tibia (lower hind leg) fragment was probably from a hind-shank cut.

Maturation data from toothwear and bone fusion patterns indicated one individual was 10 to 12 months old.

Sus scrofa (Pig)

Pig remains (n=36) were more common than those of other species but many were tooth fragments, which were usually discarded after initial butchering.

A variety of post-cranial fragments were recorded and represented fore and hind leg, shoulder, rib, and vertebrae elements. Foreleg pieces were most prevalent (n=7) including two humerus (upper foreleg) fragments from picnic-shoulder cuts, one ulna (lower-foreleg) specimen from a shoulder-hock cut, and four foot bones which represent either pig's feet cuts or discarded butchering refuse (Figure 60). Other materials included three femur (upper hind leg) fragments. Two of these were the remains of shank-half hams, the other was a symmetrically sawed section from a butt-half ham slice (Figure 60). Such symmetrically sawed specimens (pig and cow) suggest a systematic butchering technology that was more prevalent by the mid 1800s.

Vertebrae and rib fragments were also recorded and most likely represented sparerib, loin, and sirlion cuts.

Maturation data, especially from tooth wear patterns, suggested two individuals were less than a year old at butchering.

Caprinae (Sheep-Goat)

Three bone fragments were recorded for this group but were too deteriorated for species identification. One molar, a phalanx (toe), and an ulna (lower foreleg) fragment were identified. The ulna was from a fore-shank cut and exhibited green discoloration, possibly from association with metal refuse such as copper.

Equus sp. (Horse-Mule)

This material included five fragments: a left mandible, vertebrae, toe, and ankle fragments. Poor preservation prevented specific identification, but horse and mule were undoubtedly common in the site area.

Large mammal (unidentified)

This material represented the largest group (n=115) in the sample. Most fragments were from long (leg and shoulder) bones, many of which were burnt (incinerated) due either to food preparation or refuse burning (Table 47). The high density of long bone remains is not surprising considering they represent the meatiest parts of most animals.

TABLE 47. Distribution of large mammal fragments in miscellaneous features.

Fragment Type	Number
Long bone fragments (unburnt)	30
Long bone fragments (incinerated)	64
Rib fragments	13
Vertebrae fragments	6
Cranial fragments	2
Total:	115

Most of these fragments are probably the remains of large domestic mammals, especially since large wild species were not identified in the assemblage.

Sciurus carolinensis (Gray Squirrel)

A single squirrel cranial fragment was identified, representing the only small mammal in this assemblage. Squirrels prefer woodland-forest habitats and were probably common in the site area.

Gallus gallus domesticus (Chicken)

Only one chicken bone was identified. Since it is a very common food species, the paucity of chicken remains, as well as those of other birds, was surprising. Considering that bird remains have been preserved at other sites with similar, adverse environmental conditions, their scarcity is more likely linked to cultural factors and/or limited sampling of the site.

Meleagris gallopavo (Turkey)

One turkey bone fragment was recorded. Although not as prevalent as chicken, the turkey is another relatively important food species.

Other bird remains consisted mostly of white eggshell fragments representing chicken-size birds.

Turtle (unidentified)

One turtle carapace (upper shell) fragment was recorded but was too deteriorated for species identification. Both land (box turtle) and aquatic (soft shell, snapper, painted turtle, etc.) turtles inhabit areas adjacent to the site.

Perca flavescens (Yellow Perch)

Three yellow perch scales were identified. This species occupies a variety of freshwater and estuarine habitats including various size streams, rivers, lakes and ponds, and is a popular game fish.

Overview Discussion: Miscellaneous Features

The entire sample consisted of 224 bone and scale fragments. Seven species were identified, and the majority of the remains were from large mammals especially domestic species - pig, cow, sheep, goat, and horse-mule. Chicken and turkey were identified, but only by one fragment each. Wild animal remains were scarce and included elements from small species such as squirrel, turtle, and fish.

Element and meat portion distributions varied between the major identified species: pig and cow. Cranial (especially teeth) remains outnumbered those from post-cranial elements for both species. This is, undoubtedly, linked to differences in physical deterioration of the remains where dense, thick bones such as teeth, toes, etc., are more weather-resistant than other skeletal parts. Not associated with meaty portions, cranial elements (teeth, jaws, etc.) were usually discarded during initial butchering. Cow post-cranial materials included leg and shoulder pieces. Several specimens were symmetrically sawed and represented specialty meats, including shortribs and a shoulder steak or roasts. Pig remains were more diverse, including shoulder, back, rib, fore, and hind leg elements. This material represented picnic-shoulder, shoulder-hock, and shank-half ham meats. One specimen was a symmetrically sawed hind leg section from a butt-half ham slice. The remains of symmetrically sawed specialty meats from both pig and cow represents systematic butchering technology more common by the mid 1800s which corresponds with the dates for most sawed remains in this assemblage.

Maturation data for large domestic species was limited. One cow and two pigs were less than a year old at death.

Feature 120

The faunal remains from Feature 120 were recovered from a relict creek bed deposit located near the site. The mean ceramic date for this assemblage is around 1850, but other dating tools point to a deposition date of 1835 to 1845.

The entire assemblage consisted of 121 bone fragments, weighing 544.8 grams, and all but one specimen were from large domestic mammals, especially cow and pig.

The assemblage was in poor physical condition, and most specimens were broken in small pieces with extensive peeling of the outside layer of bone. Bone fragments were friable and exhibited lengthwise splitting. These characteristics are often indicative of waterlogged bone, especially depositional environments with alternating wet/dry cycles. A number of specimens were abraded, possibly from stream action. Others were incinerated either from food preparation and/or refuse burning. Also, a number of fragments exhibited rust discoloration and iron fragments were identified on several specimens. Rusting iron has a detrimental effect on bone materials and causes significant damage to the outer layer of bone. Green discoloration was also observed, probably the result of deteriorating copper materials. Evidence of scavenging was not observed in the assemblage, most likely a result of the depositional environment.

Bos taurus (Cow)

Eight post-cranial fragments, mostly from hind limbs, were present and many were axed or symmetrically sawed (Table 43). One axed fragment was a vertebra representing a rib-roast or short-loin cut (Figure 59). Forelimb remains included one scapula (shoulder-blade) piece from a blade pot-roast and one axed humerus (upper foreleg) fragment representing a rolled-shoulder cut. Hind leg remains included two femur (upper hind leg) fragments: one from a round-roast cut, and the other a symmetrically sawed bone section representing a round-steak specialty portion. Two tibia (lower hind leg) specimens were present. One represented a hind-shank cut; the other, a symmetrically sawed bone section from a shank-steak specialty portion. As such, the cow remains represented a variety of specialty meats but most were poorer quality.

One specimen, probably from a femur shaft, was extensively modified (cut and shaped) and represented a tool handle fragment.

Maturation data from bone fusion patterns, indicated one individual was at least 1.5 years old.

Sus scrofa (Pig)

Ten pig bone fragments were present. Half were teeth that are associated with body parts usually discarded during initial butchering. Post-cranial specimens included forelimb and innominate (pelvis) fragments, representing two picnic-shoulder and two butt-half ham meat portions, respectively. One specimen, a scapula (shoulder-blade), exhibited fine knife-like cut marks from initial disarticulation. Compared with the specialty meats recorded for cow, all pig remains represented standard, bulk meat portions (Figures 59 and 60). Unlike those of cow, pig remains included initial butchering refuse (tooth and skull fragments).

One specimen, a thick tibia shaft fragment, was smoothed and polished, probably from a tool handle.

Pig maturation data from toothwear and bone fusion rates indicated two individuals were less than a year old.

Ovis aries (Sheep)

One element was identified as sheep, which included a humerus (upper foreleg) fragment from a foreshank meat cut (Figure 61).

Another specimen too deteriorated for identification (*Caprinae*: Sheep-Goat) consisted of a lower foreleg (radius) fragment.

Large mammal (unidentified)

This collection (n=100) consisted mostly of leg bone fragments (n=78), which is not surprising since they are associated with most bulk meat portions. All but three of the fragments were burnt or incinerated, the result of either food processing or refuse burning. A fragment from a finished button was recorded and was apparently cut from a large mammal rib shaft.

Most likely, the bulk of this collection represents the remains of large domestic species, as large wild animals were not identified.

Syvilagus sp. (Rabbit)

A single rabbit innominate (pelvis) fragment was identified. Curiously, the specimen was a sawed section which suggested highly specialized small animal butchering at the site. This type of technology is rare in most faunal assemblages and may simply represent an isolated example.

Overview Discussion: Feature 120

Nearly all the faunal remains from Feature 120 were large mammal bone fragments from domestic species. Cow and pig were most frequently identified; however, due to poor preservation, 83% of the remains were unidentified.

Most bone fragments represented meaty portions of the animals and many specimens were sawed, cut, or axed. There were interesting differences when comparing cow and pig remains. Cow bones included only post-cranial specimens, representing specialty meats (short-loin, rolled-shoulder, round-steak and shank-steak), many of which were symmetrically sawed. Conversely, pig remains included cranial material probably from initial butchering refuse, as well as post-cranial fragments representing standard bulk meats (picnic-shoulder, butt-half hams), which were cut but not sawed.

Maturation data indicated that one cow was at least 1.5 years old at death, and one pig was less than a year old at death.

Conclusions: Harford Furnace site

The faunal remains from the Harford Furnace site (18HA148) consist of 2048 bone, shell (egg), and scale (fish) fragments which weigh 4818.8 grams. The information presented in this report was derived from the analysis of an excavated sample that was highly fragmented and, in most cases, poorly preserved.

The remains represented a partial sample of the site, recovered from various deposits (Table 48).

TABLE 48. Distribution of faunal remains from Harford Furnace site contexts.

	Number of Specimens	Number of Identified Species
Plowzone contexts	1381	18
Grab samples from plowzone	88	8
House features	234	9
Miscellaneous site features	224	7
Relict creek bed feature	121	4
Totals:	2048	

The overall site occupation dates from around 1830 to the 1880s. Feature 120 is tightly dated to the period 1835 to 1845.

Physical Condition

The physical condition varied between the major groups of faunal remains. All assemblages were highly fragmented and most (excluding the house features and grab samples) were poorly preserved. Individual specimens exhibited many of the following characteristics: lengthwise cracks, surface layer peeling, surface pitting (fungus rot), abrasions (on edges), discoloration from contact with metal refuse or fungus rot, scavenging (usually from rats), burning/incineration from food preparation or refuse burning, and cut/axe/saw modifications from initial butchering or meat processing. The most extensive damage was caused by general weathering, acidic soils, waterlogging, and probably intermittent plowing. The relict creek bed remains exhibited the most damage, including extensively abraded, peeled, and waterlogged fragments.

The frequency and distribution of skeletal remains, as well as taxonomic identification, depended, to a greater extent, on the physical condition of the remains. The highly fragmented assemblages were difficult to identify. Teeth, and other thick, dense weather-resistant elements (toe, ankle) were, usually, better preserved and more easily identified at the genus-species level. Conversely, elements such as leg bones, vertebrae, ribs, and innominates (pelvis), were too shattered and deteriorated for specific identification.

Scavenging, mostly by rats, prevailed in every major assemblage. Rat-gnawing was systematic and usually centered around joints and along shafts at points of ligament and muscle attachments. Often entire joints were destroyed by systematic gnawing that prevented identification.

Many specimens were discolored and deteriorated from contact with rusting iron materials. Bone specimens were often deeply pitted from deteriorating iron refuse. Green discolorations were also observed, apparently from contact with copper objects or related minerals.

Species Distributions

The distributions of most identified species were similar for most assemblages. In every assemblage, large mammal remains were most common. A variety of large domestic mammal species was recorded: pig, cow, sheep, *Caprinae* (Sheep-Goat), and *Equus* (Horse-Mule). By far, pig was the most common species identified and apparently provided the bulk of the meat diet, which was supplemented by cow, chicken, and fish, especially perch and catfish. Sheep remains were occasionally identified, but were generally rare. Horse or mule fragments were recorded in many collections but were too deteriorated for specific identification; however, mule was reportedly in common use at the site.

Other common species were domestic cat and rat. As discussed above, rats were common scavengers and cats represented prevalent house predators and/or pets. Partial remains of several cat burials were probably represented in a number of assemblages. The only identified bird species were chicken and turkey. Chicken was certainly an important supplementary food resource and the major poultry species. Additional remains were from small wild animals including rabbit, squirrel, turtle, and fish. Fish remains, especially those of perch and catfish, were prevalent and were undoubtedly important secondary food resources locally available. A few small species with well preserved skeletal elements, including the mole, shrew, and frog, were probably intrusive in the site deposits.

Element Distribution and Butchering

The analysis provided a wealth of information about meat portions associated with bone elements, butchering, and meat processing. Elements and meat portions varied between the common species. Pig remains consisted mostly of shoulder and fore and hind leg fragments representing a limited variety of standard, bulk meat portions including picnic-shoulder, shoulder-hock, and butt and shank half hams. A few specialty meats were recorded consisting of symmetrically sawed arm or ham steak meats. Conversely, cow usually included fore and hind leg remains, representing a variety of specialty cuts consisting of shoulder, shank, and round steak, short-loin and rolled-shoulder, as well as bulk meats such as round/rump and hind-shank roast meats. Many of these were represented by symmetrically sawed bone section from various assemblages. The evidence showed that both cow and pig refuse was axed and sawed, and a high incidence of symmetrically sawed pig remains indicates systematic butchering techniques more common by the mid 1800s.

The remains of chicken included wing and leg elements, representing wing, thigh, and leg meats.

Certain elements (teeth, toes, ankle bones, skull fragments, and scales) from the important food species (pig, cow, chicken, fish) recorded in many assemblages represented non-meaty portions which were usually removed and discarded during initial butchering and meat processing. This constituted evidence of on-site butchering practices.

Maturation

The age data for large domestic mammals was varied. The evidence from pig remains indicated that most individuals were less than a year old at death but a few were older than two years. Today, most pigs are butchered before they are a year old when the meat is most tender. Older pigs probably represented breeding stock. The evidence for cow, though less common, indicates that most individuals were more than two years old when butchered. Cows were usually older than pigs when butchered, because of a longer biological development period and cows often served as draft and dairy animals for long periods of time.

Summary

It is important to stress that even though the faunal remains from Harford Furnace in many cases were poorly preserved, the analysis has provided a wealth of information about diet, subsistence, and butchering practices at the site. Generally, the evidence showed that large domestic mammals, especially pig, represented the bulk of the meat diet, which was supplemented with cow, chicken, fish, and possibly rabbits and squirrels. Many of these animals were butchered and processed in the site area and standard bulk meats (pig) as well as specialty (cow) portions were consumed. Butchering practices included heavy axing, fine cutting, and systematic sawing associated with initial disarticulation and meat preparation.

APPENDIX X

CLOTHING ITEMS

by Alison J. Helms

APPENDIX X
CLOTHING ITEMS

The following appendix describes all the clothing items recovered from the Harford Furnace site except the shoes, which are discussed in Appendix VI. The clothing items fall into the following groups: buckles and belt parts, miscellaneous clothing fasteners, sewing items, and buttons. The button assemblage is given special attention because the size and nature of the sample lends itself to detailed analysis.

Description of Types

Buckles and Belt Parts

One copper alloy buckle, eight iron buckles, and one copper reinforcement for the end of a belt were recovered (Table 49). Buckle width was measured between the outside edges of the frame perpendicular to the direction in which the tongue swings; length was measured between the outside edges of the frame parallel to the direction in which the tongue swings. Therefore, the width of the buckle, after subtracting an average of 9 mm (2 x 4.5 mm) for the frame itself, closely approximates the width of the strap which would have passed through the buckle.

The six iron buckles recovered resemble the rectangular iron buckles with single tongues recovered from Fort Michilimackinac (Stone 1974). Stone interpreted these to be harness buckles, but they may also be belt buckles. The copper alloy buckle stamped "PARIS" recovered from Harford Furnace is identical in nearly every respect to one from the Howard-McHenry Mill site (Hurry and Kavanagh 1983). The buckle from Howard-McHenry Mill has the word "SOLIDE" stamped on the tongue above the hinge bar, missing from the Harford Furnace buckle. The mark on the buckle shows that it was made in and/or imported from Paris, France. It is most likely a harness or shoe buckle.

Miscellaneous Clothing Fasteners

Twenty-seven miscellaneous clothing fasteners were recovered, including a shirt stud, hooks and eyes, eyelets, round shoe hooks, rivets, and suspender parts (Table 50). All fasteners were made of copper alloy, with the exception of the porcelain shirt stud. The hook and eye combinations were fashioned of flattened wire. Hooks and eyes of flattened wire have been found on dresses made from 1825 - 1840 (Bradfield 1968). In five cases, leather was preserved in the crimped edges of the eyelets, indicating that they were used on leather articles of clothing.

Sewing Items

One needle, two thimbles, and 10 straight pins were recovered (Table 51). The iron needle is of a fairly large size and was suited to heavy sewing work such as making braided rugs. The copper alloy thimbles did not have identifiable styles or makers' marks; there is little difference between a thimble made in the 18th century and one made in the 19th century (Nöel Hume 1969). The tin-plated copper alloy and iron straight pins probably date closer to the end than the beginning of the 19th century, given that all had solid, flat, or flat to slightly rounded heads (Cleland 1983).

TABLE 49. Buckles and belt parts.

#	METAL ALLOY	BUCKLE OR PART DESCRIPTION	ADDITIONAL DESCRIPTION	WIDTH / LENGTH	CONTEXT
1	COPPER	RECTANGULAR FRAME, PIN AND 2-PRONGED TONGUE	BACK OF FRAME WHERE TONGUE PRONGS REST IS MARKED 'PARIS' AND STAMPED WITH A CROSSHATCH DESIGN	32 / 23 MM	PLOWZONE
1	IRON	RECTANGULAR FRAME, TONGUE	TONGUE ATTACHED TO ONE SIDE OF FRAME, METAL SHEET BENT AROUND OPPOSITE SIDE FOR REINFORCEMENT AND TO COVER THE JOINT	33 / 27 MM	PLOWZONE
1	IRON	RECTANGULAR FRAME, TONGUE	TONGUE ATTACHED TO ONE SIDE OF FRAME, METAL SHEET BENT AROUND OPPOSITE SIDE FOR REINFORCEMENT AND TO COVER THE JOINT	29 / 25 MM	FEATURE 119
1	IRON	RECTANGULAR FRAME, TONGUE	TONGUE ATTACHED TO ONE SIDE OF FRAME, METAL SHEET BENT AROUND OPPOSITE SIDE FOR REINFORCEMENT AND TO COVER THE JOINT	41 / 31 MM	PLOWZONE
1	IRON	RECTANGULAR FRAME, TONGUE	TONGUE ATTACHED TO ONE SIDE OF FRAME, METAL SHEET BENT AROUND OPPOSITE SIDE FOR REINFORCEMENT AND TO COVER THE JOINT	47 / 29 MM	RELICT CREEK
1	IRON	RECTANGULAR FRAME, TONGUE	TONGUE ATTACHED TO ONE SIDE OF FRAME, METAL SHEET BENT AROUND OPPOSITE SIDE FOR REINFORCEMENT AND TO COVER THE JOINT	22 / 20 MM	PLOWZONE
1	IRON	RECTANGULAR FRAME, TONGUE MISSING	METAL SHEET BENT AROUND ONE SIDE FOR REINFORCEMENT AND TO COVER THE JOINT	33 / 27 MM	PLOWZONE
1	IRON	FLAT, 2-PRONGED TONGUE		27 MM WIDE	PLOWZONE
1	IRON	FLAT, 2-PRONGED TONGUE		21 MM WIDE	PLOWZONE
1	COPPER	REINFORCEMENT FOR END OF BELT OR STRAP	CRESCENT SHAPED, DOUBLED OVER FLAT METAL WITH TEETH ON INSIDE EDGE FOR GRIPPING FABRIC, LEATHER IS PRESERVED WHERE EDGES ARE CRIMPED TOGETHER	37 MM WIDE	PLOWZONE

TABLE 50. Miscellaneous clothing fasteners.

#	MATERIAL TYPE	TYPE OF FASTENER	DESCRIPTION	CONTEXT
1	PORCELAIN	SHIRT STUD	4 MOLDED, CONCENTRIC RINGS DECORATE THE LARGER OF THE TWO CIRCULAR ENDS	PLOWZONE
1	Cu ALLOY	CLOSEABLE HOOK	COULD BE USED FOR LINKING TWO ENDS OF A SMALL CHAIN	PLOWZONE
3	Cu ALLOY	SKIRT OR DRESS HOOKS	MADE OF FLATTENED WIRE	PLOWZONE
1	Cu ALLOY	SKIRT OR DRESS 'EYE'	FRAGMENT, MADE OF FLATTENED WIRE	FEATURE 45
4	Cu ALLOY	EYELETS FOR SHOES OR THER LEATHER ARTICLES	LEATHER IS PRESERVED WHERE METAL EDGES ARE CRIMPED TOGETHER	PLOWZONE
1	Cu ALLOY	EYELETS FOR SHOES OR THER LEATHER ARTICLES	LEATHER IS PRESERVED WHERE METAL EDGES ARE CRIMPED TOGETHER	FEATURE 39/57
5	Cu ALLOY	EYELETS FOR SHOES, DRESSES, ETC.		PLOWZONE
1	Cu ALLOY	RIVET POST		PLOWZONE
3	Cu ALLOY	ROUND SHOE-LACE HOOKS	ALL ARE BLACK LACQUERED AND HAVE GROMMET ATTACHMENTS, ONE HAS LEATHER PRESERVED WHERE METAL EDGES ARE CRIMPED TOGETHER	PLOWZONE
1	Cu ALLOY	SKIRT, DRESS, OR SMALL PICTURE HOOK?	SINGLE CIRCULAR 'EYE' FOR ATTACHING BACK OF HOOK TO FABRIC OR WALL	PLOWZONE
1	Cu ALLOY	DECORATIVE CLOTHING RIVET OR SUSPENDER BUTTON?	GILDED OVAL TOP WITH 4 TANGS, TOP IS CONNECTED BY POST TO CIRCULAR BOTTOM	PLOWZONE
2	Cu ALLOY	SUSPENDER BUTTONS	CIRCULAR TOP AND BOTTOM ATTACHED TO CENTRAL POST AS IN A THREAD BOBBIN	PLOWZONE
1	Cu ALLOY	SUSPENDER STRAP PART	HAS STAMPED GEOMETRIC DESIGN, ATTACHES TO SUSPENDER BUTTON	PLOWZONE
2	Cu ALLOY	SUSPENDER ADJUSTER PARTS		PLOWZONE

TABLE 51. Sewing items.

#	METAL ALLOY	ITEM	ADDITIONAL DESCRIPTION	LENGTH (MM)	CONTEXT
1	IRON	NEEDLE	3-SIDED AT POINT, GRADUALLY BECOMING 2-SIDED AND ROUNDED AT EYE, EYE IS ELONGATED	93.7	PLOWZONE
1	COPPER	THIMBLE	ROLLED RIM, PATTERN STAMPED DEPRESSIONS ON CROWN AND AROUND SIDES	19.5	PLOWZONE
1	COPPER	THIMBLE	BROKEN AND FLATTENED FRAGMENT, PLAIN EXCEPT FOR STIPPLED AREA, STAMPED SCALLOPED AND FLORAL PATTERN NEAR ROLLED RIM	?	PLOWZONE
1	COPPER TIN-PLATED	STRAIGHT PIN	SOLID. FLAT HEAD	25.2	FEATURE 37
3	COPPER TIN-PLATED	STRAIGHT PINS	SOLID. FLAT HEADS	25.5 - 28.8	PLOWZONE
1	COPPER TIN-PLATED	STRAIGHT PIN	SOLID. FLAT-SLIGHTLY ROUNDED HEAD	29.0	FEATURE 112
1	IRON TIN-PLATED	STRAIGHT PIN	SOLID. FLAT HEAD	25.6	PLOWZONE
2	IRON TIN-PLATED	STRAIGHT PINS	SOLID. FLAT-SLIGHTLY ROUNDED HEADS	28.0 - 31.5	PLOWZONE
1	IRON	STRAIGHT PIN	FRAGMENT	?	FEATURE 76
1	IRON TIN-PLATED	STRAIGHT PIN	FRAGMENT, FLAT-SLIGHTLY ROUNDED HEAD	?	FEATURE 65

Buttons

The button analysis has two sections. In the first section, the buttons recovered are described in detail. When possible, initial dates of manufacture are assigned to specific styles on the basis of construction, patent date, and backmark information. In the second section, the character of the entire button assemblage is examined by: a) calculating the relative frequency of occurrence of buttons of different materials types; b) determining the ratio of decorated to plain buttons in each material group and in the button assemblage as a whole; and c) determining the size distribution of the shanked and sew-through buttons by material type.

The two hundred thirty-eight buttons recovered from the Harford Furnace site are made from a range of materials and representing a wide variety of styles. Clothing items, the majority of which are buttons, are concentrated within the plowzone in the immediate house area and to a lesser extent in the surrounding yard (see Figure 14). Buttons were also found in several front yard, back yard, and house foundation features on the site. The distribution of the clothing items over the site does not support the hypothesis that the buttons were deposited as a result of a single catastrophic occurrence, such as an upset button box. It is much more likely that they accumulated gradually in the house and surrounding yard during the course of daily sewing, quilting, and clothes washing activities and through random loss from clothing.

It can be assumed that the button assemblage recovered was deposited by the house occupants, and that this assemblage represents a sample of the button styles worn by iron furnace workers and their families from 1831 to 1880 (the length of time the site was occupied). At present, it has not been determined whether the quantity of buttons in the assemblage is typical for a 19th century domestic site. If a high quantity of buttons had been recovered, one might wonder if at some time there was a seamstress or washerwoman working on the site.

Descriptions and Initial Dates of Manufacture

Descriptions of the buttons and their initial dates of manufacture are listed in tables. The buttons are grouped according to material, and within each material group, according to type of decoration. Multiple examples of the same button style are listed in the same row. Quantity, material type, form, decoration, backmark, diameter, provenience information, and (when possible) initial dates of manufacture are listed for each unique button.

The diameters of the buttons are recorded in millimeters, inches, and lines. Army regulations (and probably customer orders) specified sizes by fractions of an inch and button manufacturers made them by line measurement-sometimes larger or smaller than specifications (Johnson 1948). One line was equal to 1/40 of an inch. It is not certain when button manufacturers began using this unit of measure.

Metal Buttons (See Tables 52 through 54)

Metal button forms are described using basic construction types defined by Wyckoff (1984). Cast with separate shank, two-piece, two-piece convex, two-piece faced, three-piece and four-piece metal button forms (Figure 62) are abbreviated 1C, 2, 2C, 2F, 3, and 4 respectively in the tables.

TABLE 52. Decorated metal buttons with shanks.

#	METAL ALLOY	FORM	DECOR. TYPE	ADDITIONAL FORM AND DECORATION DESCRIPTION	BACKMARK	DIAMETER MM	INCHES	LINES	INITIAL MANF. DATE	CONTEXT	COMMENTS
1	PEWTER	1C	CAST	RAISED, SYMMETRICAL 12-POINTED STAR ON A STIPPLED BACKGROUND SURROUNDED BY A 1.8 MM CORDED BORDER, BASKET WEAVE PATTERN IN CENTER	raised letters and symbols: * : * A M A T___	19	0.745	30	1806-1830	RELICT CREEK	ANSON MATTHEWS-PEWTERER
1	COPPER	3	PRESSED	GILDED, RAISED DESIGN OF SYMMETRICAL SPREAD EAGLE LOOKING RIGHT, HOLDING BRANCH IN RIGHT CLAW AND 3 ARROWS IN LEFT, WITH SPADE SHIELD ENCLOSING LETTER "C"	EXTRA * QUALITY *	21	0.825	33	1823	PLOWZONE	MILITARY UNIFORM-CAVALRY
1	COPPER	3	PRESSED	GILDED, RAISED DESIGN OF SYMMETRICAL SPREAD EAGLE WITH SPADE SHIELD ENCLOSING LETTER "D"	SCOVILL_____EXTRA	14	0.55	22	1823	PLOWZONE	MILITARY UNIFORM-DRAGOONS
1	COPPER	4	PRESSED	GILDED, RAISED DESIGN OF SYMMETRICAL SPREAD EAGLE ON LINED FIELD LOOKING RIGHT, HOLDING 4 ARROWS IN RIGHT CLAW AND BRANCH IN LEFT, WITH LINED SHIELD, 24 STARS ENCIRCLE THE EAGLE	_________EX______	22.6	0.885	35	1832	PLOWZONE	MILITARY UNIFORM-GENERAL STAFF
2	COPPER	3	PRESSED	GILDED, IMPRESSED DESIGN OF 6-PETALLED SYMMETRICAL FLOWER ON BACKGROUND OF TINY MESHED DIAMOND SHAPES		11.9	0.465	18	1823	PLOWZONE	
1	COPPER	3	PRESSED	GILDED, RAISED DESIGN OF 14 SMALL FLOWERS ENCIRCLING A CENTRAL FLOWER OF THE SAME SIZE AND SHAPE AS THE BORDER FLOWERS	* EXTRA GILT * COLR	12.7	0.5	20	1823	PLOWZONE	
1	COPPER	2	COINED	GILDED, RAISED DOUBLE-CURVED STRIPE PATTERN	raised letters and symbol: TRE___ LONDON (CROWN)	13	0.515	20	1830	PLOWZONE	
1	COPPER	2C	STAMPED	GILDED, IMPRESSED DESIGN OF SYMMETRICAL 6-PETALLED FLOWER WITH A RAISED CONVEX CENTER		20.4	0.803	32	1830	PLOWZONE	
1	COPPER	2F	PRESSED	GILDED, RAISED DESIGN OF FLOWERS IN A POT WITH AN OPEN LID ON A PLAIN FIELD SURROUNDED BY A RAISED, PLAIN BORDER OF 1.8 MM		12.4	0.485	19	1815	RELICT CREEK	
1	IRON	2	PLAIN	FABRIC COVERED WITH POSSIBLE CARDBOARD DISK UNDER FABRIC		21	0.825	33		RELICT CREEK	
1	IRON	2	PLAIN	POSSIBLY FABRIC COVERED		21.7	0.85	34		PLOWZONE	
1	IRON	3	PLAIN	PROBABLY FABRIC COVERED		14	0.55	22		PLOWZONE	
1	COMPOUND	3	PRESSED	GILDED, Cu-ALLOY FRONT AND IRON BACK FILLED WITH CARDBOARD-LIKE MATERIAL, RAISED GEOMETRIC DESIGN WITH 2-PART SYMMETRY		15.5	0.61	24	1823	FEATURE 119	

TABLE 53. Plain gilded metal buttons with shanks.

#	METAL ALLOY	FORM	DECOR. TYPE	ADDITIONAL FORM AND DECORATION DESCRIPTION	BACKMARK	AVG. MM	DIAMETER IN	LINES	INITIAL MANF. DATE	CONTEXT
1	COPPER	3	PLAIN	GILDED		13.4	0.525	21	1823	PLOWZONE
1	COMPOUND	3	PLAIN	GILDED, Cu ALLOY FRONT AND IRON BACK FILLED WITH CARDBOARD LIKE MATERIAL					1823	PLOWZONE
1	COPPER	2	PLAIN	GILDED	RICH *_____LD___	12.8	0.5	20	1790	PLOWZONE
1	COPPER	2	PLAIN	GILDED	RICH TREBLE LONDON	13	0.512	20	1790	FEATURE 66
1	COPPER	2	PLAIN	PROBABLY GILDED	unreadable	13.3	0.52	20	1790	RELICT CREEK
2	COPPER	2	PLAIN	GILDED	* ORANGE * COLOUR	14	0.555	22	1790	PLOWZONE
1	COPPER	2	PLAIN	PROBABLY GILDED	_____T________D	17.8	0.7	28	1790	RELICT CREEK
1	COPPER	2	PLAIN	PROBABLY GILDED	IMPERIAL STANDARD	18.3	0.72	28	1790	PLOWZONE
1	COPPER	2	PLAIN	GILDED	* * * __ARRAN__D * * * ORANGE	18.4	0.725	29	1790	PLOWZONE
1	COPPER	2	PLAIN	GILDED	unreadable	19.7	0.775	31	1790	PLOWZONE
2	COPPER	2	PLAIN	GILDED	unreadable	19.7	0.775	31	1790	RELICT CREEK
1	COPPER	2	PLAIN	GILDED	TREBLE GILT *** ORANGE ***	19.8	0.775	31	1790	PLOWZONE
1	COPPER	2	PLAIN	GILDED	unreadable	20.9	0.825	33	1790	PLOWZONE
1	COPPER	2	PLAIN	GILDED	unreadable	20.9	0.825	33	1790	FEATURE 31

TABLE 54. Metal and ceramic sew-through buttons.

#	MATERIAL TYPE	NUMBER OF HOLES	DECORATION TYPE	PANEL DIAMETER (MM)	FORM AND DECORATION DESCRIPTION	AVG. DIAMETER MM	INCHES	LINES	INITIAL MANF. DATE	CONTEXT
2	PORCELAIN	2	COLORED BODY	MAX: 6.6	BROWN, HAS A DEPRESSED EDGE OF 2MM SURROUNDING A CONVEX CIRCULAR CENTER CONTAINING AN OVAL PANEL	14	0.55	22	1840	PLOWZONE
1	PORCELAIN	2	COLORED BODY	MAX: 7.5	BROWN, HAS A DEPRESSED EDGE OF 2.5 MM SURROUNDING A CONVEX CIRCULAR CENTER CONTAINING AN OVAL PANEL	16.8	0.66	26	1840	PLOWZONE
1	CLAY	4	PLAIN	6.5	HAND MODELLED MICACEOUS CLAY, ROUGHLY DIAMOND SHAPED	15.5	0.6	NA		PLOWZONE
1	Zn ALLOY	4	STAMPED	8.5	ONE-PIECE, BLACK LACQUERED, BORDER HAS IMPRESSED MESH DESIGN FOLLOWED BY RAISED, PLAIN EDGE OF 1.2 MM, PUSHED BACK PANEL FORMS SELF-SHANK	16.5	0.65	26	1830	PLOWZONE
1	Cu ALLOY	4	PLAIN	9.8	TWO-PIECE, FRONT CRIMPED OVER BACK CONSTRUCTION WITH BACK MISSING	12	0.47	18	1790	PLOWZONE
1	Cu ALLOY	4	PLAIN	8.7	TWO-PIECE, FRONT CRIMPED OVER BACK CONSTRUCTION, IMPRESSED BORDER, RAISED PLAIN EDGE	13.9	0.55	22	1790	PLOWZONE
1	IRON	4	PLAIN	9.0	TWO-PIECE, FRONT CRIMPED OVER BACK CONSTRUCTION	14.3	0.56	22	1790	PLOWZONE
1	IRON	4	PLAIN	9.0	TWO-PIECE, FRONT CRIMPED OVER BACK CONSTRUCTION	14.3	0.56	22	1790	FEATURE 72
1	IRON	4	PRESSED	9.3	TWO-PIECE, FRONT CRIMPED OVER BACK CONSTRUCTION, BORDER HAS IMPRESSED MESH DESIGN, RAISED PLAIN EDGE	14.2	0.56	22	1790	PLOWZONE
1	IRON	4	PLAIN	10.0	TWO-PIECE, IMPRESSED BORDER, RAISED PLAIN EDGE	17.8	0.7	28	1790	SLAG ROAD

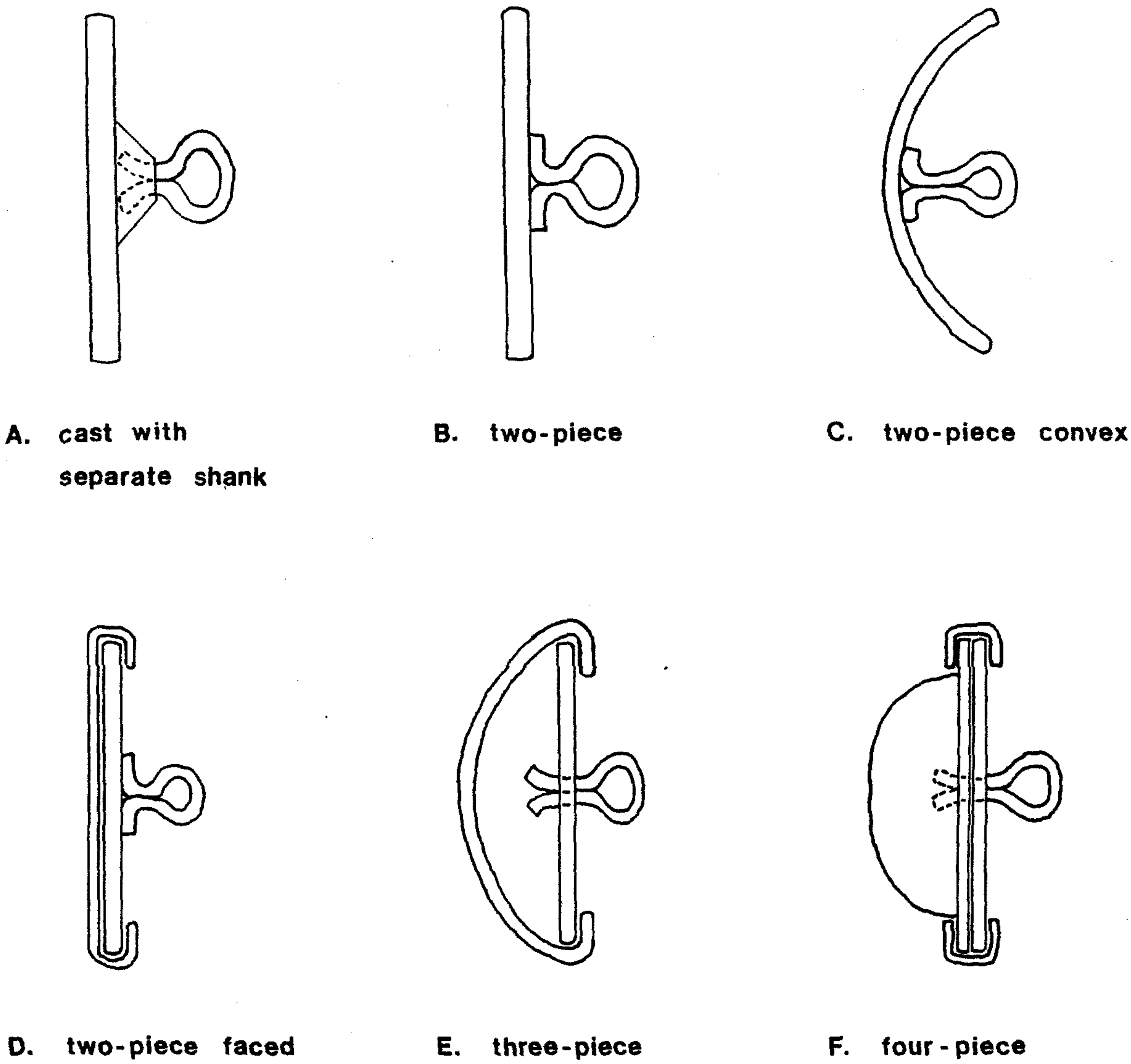


FIGURE 62. Metal button forms (after Wyckoff 1984).

Plain gilded, copper alloy, two-piece Omega Type buttons were first produced beginning in 1790 in England and around 1800 in the U.S. (Johnson 1948) (Figure 63f). They were manufactured by cutting circular blanks out of sheets of rolled metal. Wire loop shanks were then braised on the back. Normally flat, these buttons often have the name of the maker or words denoting quality such as "DOUBLE GILT" stamped on their backs. Gilding, chasing, and coining were methods used to decorate these buttons. Plain gilt buttons were manufactured from 1800-1865 (Luscomb 1967). After 1830, manufacturing advances permitted the production of more elaborate buttons.

Metal buttons with coined decorations (see Figure 63e) were assigned the initial manufacturing date of 1830 because this method was rarely used on buttons before that date (Luscomb 1967).

Jacksonian metal buttons were small one-piece buttons with a separate plain rim turned over the edge to form a border. All were brass, gilt finished with a plain disk having a raised single figure design and ranging in size from 1/2 to 3/4 inch (Luscomb 1967). A Jacksonian-like metal button recovered from Harford Furnace (Figure 63f) does not have the separate plain rim required of Jacksonian Type buttons, but does match it in style. This two-piece faced button has a raised design of flowers in a pot with an open lid and the whole motif is circled by a raised, plain self border. This button dates from 1815 to about 1850 (Johnson 1948; Luscomb 1967).

Three-piece Sanders Type buttons (Figure 63b, d) were constructed by locking together two pieces of thin metal by turning the edge of the front piece over the edge of the back piece (Johnson 1948). Decoration, if present, on this type of button was always machine pressed, which involved pressing a sheet of thin metal between a pair of matching dies: the upper (outside) die forming the design in relief, the lower (back) die forcing the metal into the former. This form of button dates from 1823, when the R. Sanders patent was granted, but "came so slowly and gradually into use that the exact time is not known but was seemingly in the late 1820s" (Johnson 1948:14). Construction of buttons in this form and in this manner has continued to the present.

Four-piece staff type buttons have high, full-domed fronts and flat backs (Johnson 1948) (Figure 63c). The edges of the front and back are horizontal and clamped together by a plain, separate rim. The earliest identified button constructed in this fashion was produced by the Scovill factory in 1832. Buttons of this type were used by the United States Army General Staff from 1832 to 1902 (Johnson 1948).

The metal sew-through buttons from Harford Furnace were constructed from one or two pieces of stamped metal, and were assigned initial manufacturing dates of 1790 because machine stamping was a part of their manufacture. The two-piece metal sew-throughs recovered had machine-stamped fronts and backs of thin metal with the front crimped over the back to hold the two parts together. South (1964) reports buttons of this description with fiber or wooden centers from Brunswick Town and Fort Fischer (Type 21), with context dates of 1800-1865. No evidence of fiber centers was found in fractured metal sew-throughs from Harford Furnace, but the manufacturing technique was otherwise identical.

Two metal buttons from Harford Furnace had backmarks attributable to specific makers. The first, a pewter button (Figure 63a), had a raised design of a symmetrical 12-pointed star with a basket weave pattern in the center, and a raised backmark composed of the letters and symbols " * : * A M A T ." This is the mark of Anson Matthews, a pewterer from Southington, Connecticut, who was in business from 1806-1830. There are probably more pewter buttons found today with "A. Matthews" on the back than with any other marking. Matthews buttons were all made with wire shanks (Luscomb 1967).

The second button was a heavily corroded military uniform button with a symmetrical spread eagle device and a spade shield containing a raised letter "D," indicating the Dragoons branch. The backmark appeared to read "SCOVILL EXTRA." A button of identical device with the backmark "SCOVILLS & Co. EXTRA" was recovered from excavations at Kanaka Village/Vancouver Barracks (Chance and Chance 1976). The firm Scovills and Company, Waterbury Connecticut, probably manufactured this button between 1840 and 1850 (Johnson 1948; Luscomb 1967). Unissued stores of this button style may have been used by the militia after 1861 (Wyckoff 1984). The button matches the 1851 dimension specifications of 0.5 inches for small size uniform buttons for enlisted men in the Dragoons branch (Albert 1977).

Two other military uniform buttons were recovered. The first was a three-piece gilded copper alloy Cavalry button, dating from 1855 - ca. 1880 (Wyckoff 1984). The second was a four-piece gilded copper alloy button used by the Army General Staff, dating from 1850-1875. The presence of these military uniform buttons on the site and their time frame leads one to suspect that members of the Harford Furnace community were directly or indirectly involved in the Civil War. Perhaps one or a few of the house occupants enlisted to fight, or perhaps the site was visited by passing soldiers during the war.

Corrosion in many instances made reading backmarks on metal buttons difficult or impossible. At the suggestion of Darlene Wells (Geologist, Maryland Geological Survey), an attempt was made to "see through" the corrosion using xeroradiography. Gabrielle Donovan (X-ray Technician, Johns Hopkins Hospital) took the xeroradiographs for this experiment.

Five metal buttons were chosen, each with an obscured backmark. Three of these buttons also had partially obscured embossed designs on the fronts.

Item #1: a heavily corroded three-piece gilded copper alloy button from the Dragoon's branch of the military (Plowzone).
Item #2: a plain two-piece gilded copper alloy button with an extremely corroded, nearly obliterated backmark (Plowzone).
Item #3: a one-piece, cast with separate shank pewter button with a clear raised design on the front and an obscured backmark (Relict Creek Deposit).
Item #4: a four-piece gilded copper alloy General Staff military button with a completely obscured, heavily corroded backmark and a partially obscured design on the front (Plowzone).
Item #5: a plain, two-piece gilded copper alloy button with a crushed and deformed backmark and very little corrosion (Plowzone).

The five were placed backmark down on a charged selenium plate in a plastic cassette in direct contact with the cassette surface to minimize the distortion of the image. At a distance of 40 inches, four successive xeroradiographs were taken at constant mAs (milliamps-seconds) and increasing kV (kilovoltage). The exposed

FIGURE 63. Selected metal buttons.

a. A two-piece cast pewter button with separate wire shank. Backmark reads: "*:* AMAT ____." Made by Anson Matthews, Southington CT, 1806-1830. Relict Creek Deposit.

b. 3-piece guilded copper alloy military uniform button-Cavalry. Backmark reads: "EXTRA * QUALITY *." 1855-C.1880 (Wyckoff 1984), initial date of manufacture: 1823. Plowzone.

c. 4-piece guilded copper alloy military uniform button - U.S. Army General Staff. Backmark masked by corrosion. 1850-1875 (Wyckoff 1984), initial date of manufacture: 1832. Plowzone.

d. 3-piece guilded copper alloy button with impressed symmetrical floral design. No backmark. Initial date of manufacture: 1823. Plowzone.

e. 2-piece guilded copper alloy button with coined double-curved stripe pattern. Backmark reads: "TRE ___ LONDON" and pictures a crown. Initial date of manufacture: 1830. Plowzone.

f. 2-piece faced guilded copper alloy Jacksonian-like button with raised design of flowers in a pot with an open lid. The whole motif is circled by a raised, plain self-border. No backmark. Initial date of manufacture: 1815. Relict Creek Deposit.

g. 2-piece guilded plain copper alloy button. Backmark reads: "ORANGE * COLOUR *" Initial date of manufacture:1790. Plowzone.

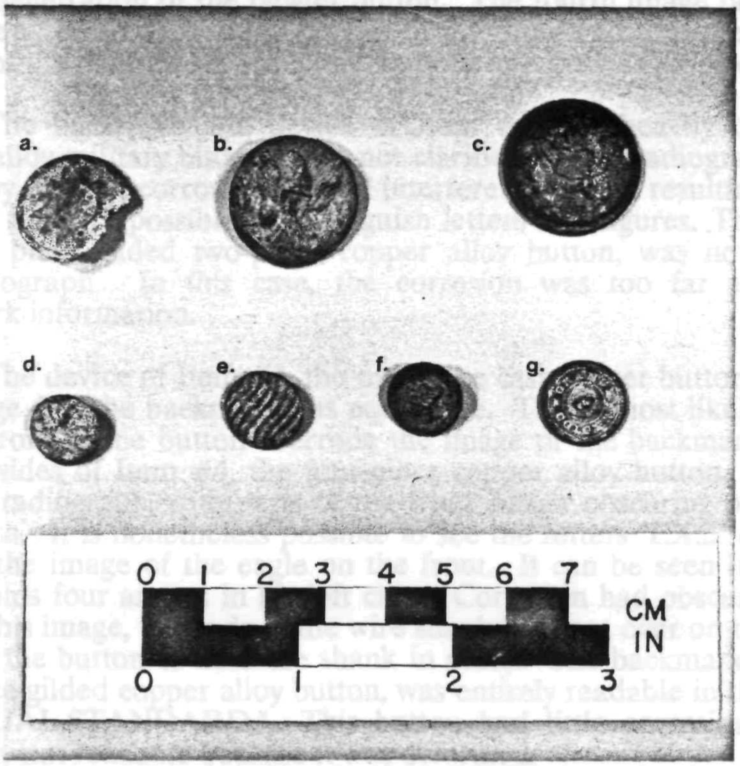


FIGURE 63. Selected metal buttons.

plates were processed in positive mode, resulting in images where the thick parts of the metal buttons showed up dark blue and the thinner parts showed up in lighter shades of blue and white.

The first image, taken at a setting of 125 mAs and 30 kV showed no penetration. The second image, taken at 125 mAs and 50 kV showed no penetration of the solid buttons, but slight penetration of the three and four piece buttons. The third image, taken at 125 mAs and 64 kV showed good images of the three and four-piece buttons, slight penetration of the plain two-piece gilded buttons and no penetration of the pewter button. The fourth image taken at 125 mAs and 90 kV resulted in washed-out images of the three and four-piece buttons and good images of the plain two-piece gilded buttons and the one piece cast pewter button.

The backmark and device of Item #1, the heavily corroded three-piece copper alloy military button, were not clarified by xeroradiography. It appears that the heavy layer of corrosion created interference on the resulting image to the point where it was not possible to distinguish letters and figures. The backmark of Item #2, the plain gilded two-piece copper alloy button, was not readable from the xeroradiograph. In this case, the corrosion was too far advanced to retrieve backmark information.

The device of Item #3, the one-piece cast pewter button, appeared clearly in the image, but the backmark was not visible. This is most likely because the image on the front of the button overrode the image of the backmark. The obverse and reverse sides of Item #4, the four-piece copper alloy button, are superimposed in the xeroradiograph, with parts of the front design obscuring parts of the back and vice versa. It is nonetheless possible to see the letters "EX..." of the backmark and discern the image of the eagle on the front. It can be seen in the image that the eagle holds four arrows in his left claw. Corrosion had obscured this detail to the eye. In this image, the ends of the wire shank are bent over on the inside of the back plate of the button to hold the shank in place. The backmark of Item #5, a plain two-piece gilded copper alloy button, was entirely readable in the xeroradiograph as "IMPERIAL.STANDARD." This button had little corrosion; its backmark was originally not readable because it was deformed.

Xeroradiography, in two out of five of the buttons tested, helped read corroded backmarks and clarified obscured embossed figures. In this experiment, the best results were obtained on the four-piece copper alloy button xeroradiographed at 125 mAs, 65 kV and the gilded two-piece copper alloy button xeroradiographed at 125 mAs, 90 kV. In order to get a good image, the solid metal buttons required higher kV than the hollow three and four piece buttons. The most readable image obtained in this experiment was of Item #5, a deformed and squashed button with little corrosion. A good image was produced in Item #4, in spite of its uniform layer of corrosion. Unfortunately, the superimposed front and back images made reading most of the backmark difficult. No clear image of Item #1 was produced, probably because of the thickness of corrosion on the button. The presence or absence and thickness of the corrosion on the button seems to directly effect the clarity of the resulting xeroradiograph. Further experimentation using different settings may bring better results in the future.

Ceramic Buttons (see Tables 55 through 58)

All but one of the ceramic buttons recovered from Harford Furnace were made of white or colored body porcelain. The exception was made of micaceous

TABLE 55. Colored body and transfer printed (Calico) Prosser sew-through buttons.

#	FORM	BODY STYLE	NUMBER OF HOLES	PANEL DIAMETER (MM)	DECORATION TYPE	ADDITIONAL FORM AND DECORATION DESCRIPTION	AVG. MM	DIAMETER INCHES	LINES	INITIAL MANF. DATE	CONTEXT
1	PROSSER	A	4	5.0	COLORED BODY	BLUE, FRAGMENT	10.2	0.4	16	1840	PLOWZONE
1	PROSSER	A	4	5.3	COLORED BODY	BROWN	10.2	0.4	16	1840	PLOWZONE
1	PROSSER	A	4	5.5	COLORED BODY	BROWN	10.7	0.42	16	1840	FEATURE 57
1	PROSSER	A	4	5.0	COLORED BODY	BROWN	11.1	0.435	17	1840	PLOWZONE
1	PROSSER	A	4	6.0	COLORED BODY	BLUE, FRAGMENT	11.3	0.445	17	1840	PLOWZONE
1	PROSSER	D	4	6.0	COLORED BODY	BLACK, PAINTED WITH GOLD LUSTER, RAISED ROUND BORDER OF 3.3 MM	12.6	0.492	20	1840	PLOWZONE
1	PROSSER	B	4	6.0	COLORED BODY	BLUE, 1.5 MM RAISED KNOB IN CENTER OF HOLES	12.7	0.5	20	1840	PLOWZONE
1	PROSSER	A	4	4.7	TRANSFER	CALICO, WHITE WITH VERY FAINT BLUE OR PURPLE DOTTED STRIPE PATTERN	10	0.38	15	1840	PLOWZONE
1	PROSSER	A	4	4.5	TRANSFER	CALICO, WHITE WITH LAVENDER 5-POINTED STAR PATTERN	10.7	0.42	16	1840	PLOWZONE
1	PROSSER	A	4	5.0	TRANSFER	CALICO, WHITE WITH BROWN CHECKERED PLAID PATTERN	10.8	0.425	17	1840	PLOWZONE
1	PROSSER	A	4	5.0	TRANSFER	CALICO, WHITE WITH BLUE DIAMOND PATTERN	10.8	0.425	17	1840	PLOWZONE
2	PROSSER	A	4	5.5	TRANSFER	CALICO, WHITE WITH GREEN FLORAL/FOLIATE PATTERN	11	0.435	17	1840	PLOWZONE
1	PROSSER	A	4	6.1	TRANSFER	CALICO, WHITE WITH VERY FAINT MODIFIED FLOWER PATTERN OF UNKNOWN COLOR	11.3	0.445	17	1840	PLOWZONE

TABLE 56. Transfer printed (banded) and molded Prosser sew-through buttons.

#	FORM	BODY STYLE	NUMBER OF HOLES	PANEL DIAMETER (MM)	DECORATION TYPE	ADDITIONAL FORM AND DECORATION DESCRIPTION	AVG. DIAMETER MM	INCHES	LINES	INITIAL MANF. DATE	CONTEXT
1	PROSSER	A	4	4.5	TRANSFER	WHITE, SINGLE GREEN BAND AT EDGE	9.1	0.355	14	1840	PLOWZONE
1	PROSSER	A	4	4.5	TRANSFER	WHITE, SINGLE BROWN BAND AT EDGE	9.3	0.367	14	1840	PLOWZONE
1	PROSSER	C	4	4.8	TRANSFER	WHITE, ONE BROAD BROWN BAND AT EDGE	9.9	0.39	15	1840	PLOWZONE
1	PROSSER	C	4	6.0	TRANSFER	WHITE, ONE BROAD RED BAND AT EDGE	10.8	0.425	17	1840	PLOWZONE
1	PROSSER	A	4	6.0	TRANSFER	WHITE, 2 GREEN BANDS, 1 AT EDGE AND 1 AROUND PANEL	11	0.43	17	1840	FEATURE 72
1	PROSSER	A	4	6.4	TRANSFER	WHITE, ONE BROAD BLUE BAND AT EDGE	11.2	0.44	17	1840	PLOWZONE
1	PROSSER	A	4	8.0	TRANSFER	WHITE, 2 ORANGE BANDS, 1 AT EDGE AND 1 AROUND PANEL	13.2	0.52	20	1840	PLOWZONE
1	PROSSER	A	4	6.2	MOLDED	WHITE, HOBNAIL BORDER 2.4 MM DIA.	11	0.435	17	1840	PLOWZONE
3	PROSSER	A	4	6.2	MOLDED	WHITE PIECRUST	11	0.431	17	1840	PLOWZONE
2	PROSSER	A	4	7.5	MOLDED	WHITE PIECRUST	14	0.55	22	1840	PLOWZONE
2	PROSSER	A	4	8.5	MOLDED	WHITE PIECRUST FRAGMENTS	16	0.625	25	1840	PLOWZONE

TABLE 57. Plain Prosser sew-through buttons.

#	FORM	BODY STYLE	NUMBER OF HOLES	PANEL DIA-METER (MM)	DECOR. TYPE	ADDITIONAL FORM AND DECORATION DESCRIPTION	AVG. MM	DIAMETER INCHES	LINES	INITIAL MANF. DATE	CONTEXT
1	PROSSER	A	3	4.2	PLAIN	WHITE	7.8	0.305	12	1840	PLOWZONE
1	PROSSER	A	3	4.5	PLAIN	WHITE	8.3	0.325	13	1840	PLOWZONE
1	PROSSER	A	4	4.5	PLAIN	WHITE	8.6	0.34	13	1840	PLOWZONE
1	PROSSER	A	2	MAX: 4.5	PLAIN	WHITE, OVAL PANEL	9.1	0.36	14	1840	FEATURE 57
1	PROSSER	A	4	5.0	PLAIN	WHITE	9.3	0.362	14	1840	PLOWZONE
1	PROSSER	A	4	4.3	PLAIN	WHITE	9.6	0.375	15	1840	PLOWZONE
1	PROSSER	A	4	4.6	PLAIN	WHITE	9.6	0.375	15	1840	FEATURE 65
1	PROSSER	A	4	5.2	PLAIN	WHITE	9.6	0.375	15	1840	FEATURE 119
1	PROSSER	D	4	5.8	PLAIN	WHITE, RAISED ROUND BORDER OF 2.0 MM	9.8	0.385	15	1840	FEATURE 70
1	PROSSER	C	4	5.5	PLAIN	WHITE	9.9	0.387	15	1840	PLOWZONE
4	PROSSER	A	4	4.3-5.7	PLAIN	WHITE	10.2	0.4	16	1840	PLOWZONE
6	PROSSER	A	4	5.0-6.0	PLAIN	WHITE	10.5	0.412	16	1840	FEATURE 116
1	PROSSER	A	4	6.0	PLAIN	WHITE	10.5	0.412	16	1840	PLOWZONE
1	PROSSER	A	2	MAX: 5.5	PLAIN	WHITE, OVAL PANEL	10.5	0.412	16	1840	PLOWZONE

TABLE 57 (Continued).

#	FORM	BODY STYLE	NUMBER OF HOLES	PANEL DIA- METER (MM)	DECOR. TYPE	ADDITIONAL FORM AND DECORATION DESCRIPTION	AVG. MM	DIAMETER INCHES	LINES	INITIAL MANF. DATE	CONTEXT
9	PROSSER	A	4	5.3-6.1	PLAIN	WHITE	10.9	0.43	17	1840	PLOWZONE
1	PROSSER	A	4	5.4	PLAIN	WHITE	10.9	0.43	17	1840	FEATURE 65
13	PROSSER	A	4	5.0-6.5	PLAIN	WHITE	11.2	0.44	17	1840	PLOWZONE
1	PROSSER	A	4	5.4	PLAIN	WHITE	11.2	0.44	17	1840	FEATURE 108
1	PROSSER	A	4	5.7	PLAIN	WHITE	11.5	0.45	18	1840	SLAG ROAD
3	PROSSER	A	4	5.5-6.3	PLAIN	WHITE	11.5	0.45	18	1840	PLOWZONE
2	PROSSER	A	4	6.8-7.0	PLAIN	WHITE	31.1	0.515	20	1840	PLOWZONE
5	PROSSER	A	4	7.0-8.0	PLAIN	WHITE	14.1	0.55	22	1840	PLOWZONE
1	PROSSER	B	4	6.6	PLAIN	WHITE, 1.5 MM RAISED KNOB IN CENTER OF HOLES	14.2	0.555	22	1840	PLOWZONE
1	PROSSER	A	4	7.4	PLAIN	WHITE	14.4	0.56	22	1840	PLOWZONE
1	PROSSER	A	4	8.4	PLAIN	WHITE	14.9	0.585	23	1840	PLOWZONE
1	PROSSER	A	4	9.0	PLAIN	WHITE	16	0.625	25	1840	PLOWZONE
1	PROSSER	A	4	9.5	PLAIN	WHITE	17	0.665	26	1840	PLOWZONE

TABLE 58. Porcelain, shell, black rubber, and leather buttons with shanks.

#	MATERIAL TYPE	FORM	DECORATION TYPE	BUTTON HT. (MM)	ADDITIONAL FORM AND DECORATION DESCRIPTION	DIAMETER AVG. MM	DIAMETER INCHES	DIAMETER LINES	INITIAL MANF. DATE	PROVENIENCE
1	PORCELAIN	DOME-SHAPED	PLAIN	5.0	WHITE, EMBEDDED WIRE SHANK AND SHANK PLATE	8.7	0.34	13		PLOWZONE
1	PORCELAIN	DOME-SHAPED	PLAIN	?	WHITE, BAPTEROSSES-TYPE SHANK	10.2	0.44	16	1857	PLOWZONE
1	PORCELAIN	DOME-SHAPED	PLAIN	6.0	WHITE, EMBEDDED WIRE SHANK AND SHANK PLATE	13	0.512	20		PLOWZONE
1	PORCELAIN	DOME-SHAPED	COLORED BODY	4.9	BLACK, EMBEDDED WIRE SHANK	10	0.395	16		SLAG ROAD
2	PORCELAIN	DOME-SHAPED	COLORED BODY	7.0	BLACK, BAPTEROSSES-TYPE SHANK	13.9	0.549	22	1857	PLOWZONE
1	SHELL	CONVEX FRONT	PLAIN	3.9	NO SHANK OR SHANK HOLE PRESENT, PERHAPS BUTTON WAS SET INTO A METAL BACKING TO WHICH A SHANK WAS ATTACHED	7.7	0.3	12		PLOWZONE
1	SHELL	CONVEX FRONT	PLAIN	4.9	METAL SHANK SET INTO HOLE IN BUTTON BACK	22.2	0.875	35		PLOWZONE
1	SHELL	FLAT FRONT	PLAIN		METAL SHANK SET INTO HOLE IN BUTTON BACK	24	0.94	38		PLOWZONE
1	B. RUBBER	CONVEX FRONT	MOLDED		SLIGHTLY CONVEX, EMBEDDED WIRE SHANK, RAISED DESIGN OF 8-POINT STAR ON FRONT BACKMARK: GOODYEAR'S P=T. 1851. N.R.Co	17.7	0.695	28	1851	PLOWZONE
1	LEATHER	DOME-SHAPED	PLAIN	5.0	EMBEDDED WIRE SHANK	8.3	0.325	13		PLOWZONE
1	LEATHER	FLAT FRONT	PLAIN		EMBEDDED WIRE SHANK, BUTTON FRAGMENT	?	?	?		FEATURE 39 AND 57

clay. The vast majority were either Prosser sew-throughs or gaiter buttons. Three colored body porcelain buttons had smooth bottoms and lacked the tiny indentations found on the undersides of Prosser buttons. These, obviously manufactured using a different technique, are described individually in Table 58.

Prosser buttons were made of porcelain using a process patented in Britain by Richard A. Prosser in June of 1840 (Albert and Adams 1970). Richard's brother, Thomas, received an American patent for the same invention on July 29, 1841. The Prosser technique described in Thomas Prosser's patent involved taking dry clay and metal oxides in powder form and compressing them in a metal mold using a screw-press until the clay cohered and retained the form of the button. The buttons were then fired and glazed. They could be painted or printed in a manner similar to ordinary porcelain, and if they were not sew-throughs, could have metal shanks attached by various means.

Basic Prosser sew-through buttons and their derivatives are generally plain white.

The back has a flat circular base which elevates slightly to a blunt edge. The face lifts slightly from the edge and this concavity surrounds a small, scooped or sunken round panel which contains the two, three or four sew-through holes. Prosser buttons can be further identified by tiny, everpresent, mold-caused indentations which surround the sew-through holes of the base (Storm 1976:118).

All of the buttons recovered from Harford Furnace identified as Prosser sew-through had the tiny indentations on the base noted by Storm (1976). The vast majority had the bevelled body style described above, but three additional body styles were noted (Figure 64). Bevelled, bevelled with knob center, inkwell, and raised round rim styles were coded 1,2,3, and 4 respectively in the tables.

A variety of decoration methods and motifs were observed on the Prosser sew-throughs:

1. Transfer printed calico patterns consisting of flowers, leaves and geometric dot-and-line designs (Figure 65c).
2. Banded designs, having one or two painted bands of color on the button border (Figure 65d and e).
3. Molded piecrust and hobnail patterns created while the button body was molded. 'Piecrusts,' resemble the edge of the crust on a pie that has been pressed together with a fork and contain radiating lines that do not extend all the way to the edge (Luscomb 1967) (Figure 65a). 'Hobnail' patterns consist of a series of raised knobs arranged in a circle around the panel or center of the button (Figure 65b).
4. Colored body buttons created by adding a coloring agent to the porcelain paste.
5. Plain white buttons with no molded designs (Figures 65f through j).

All of the Prosser sew-through buttons were assigned the initial date of manufacture of 1840: the date of Richard Prosser's patent. No initial dates have been found for specific body styles on decoration methods. It is possible that many different styles were produced within two years after the Prosser method was patented. A cache of buttons, dating to 1842 was discovered under the floorboards of the Minton's pottery. The cache contained plain white 2, 3 and 4 hole bevelled

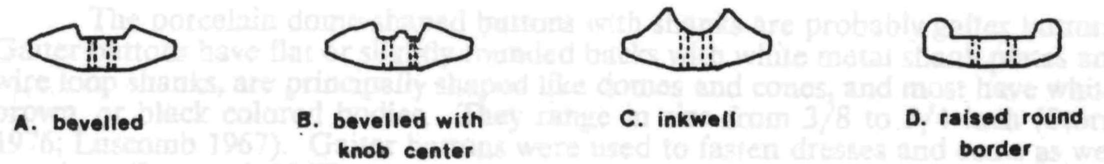


FIGURE 64. Prosser sew-through body styles shown in cross section (after Lamm et al. 1970).

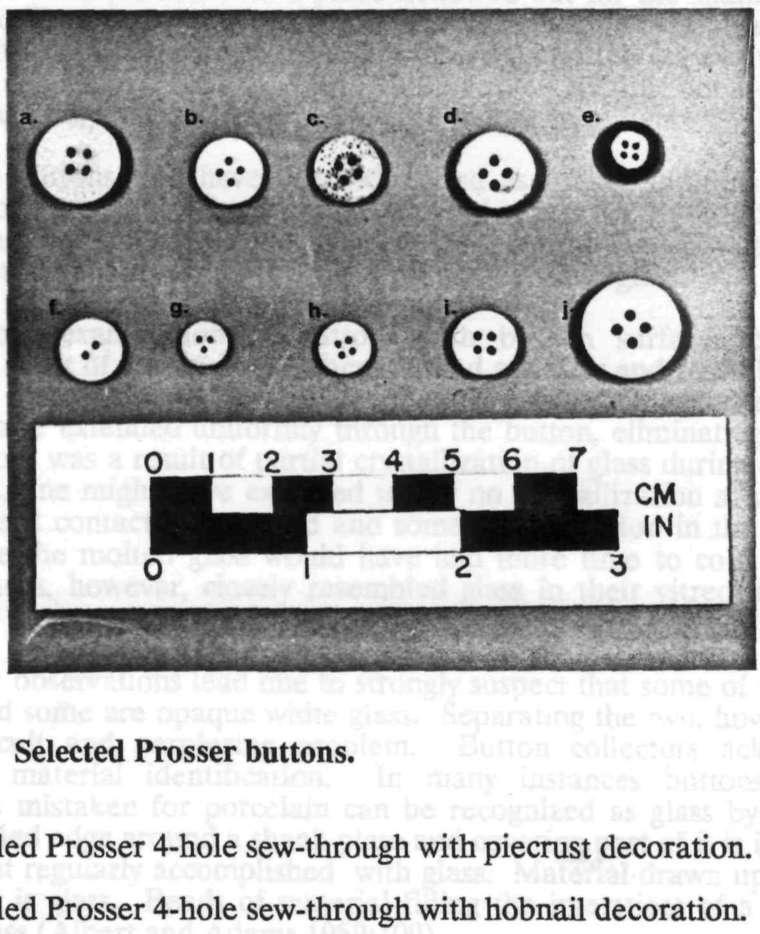


FIGURE 65. Selected Prosser buttons.

a. Bevelled Prosser 4-hole sew-through with piecrust decoration. Plowzone.

b. Bevelled Prosser 4-hole sew-through with hobnail decoration.

c. Bevelled Prosser 4-hole sew-through with greeen floral/foliate pattern. Plowzone.

d. Bevelled Prosser 4-hole sew-through with two orange bands, one at edge and one around panel. Plowzone.

e. Inkwell shaped Prosser 4-hole sew-through with one broad brown band at edge. Plowzone.

buttons, piecrust, calico decorated, colored body and molded buttons with scalloped edges (Albert and Adams 1970).

The porcelain dome-shaped buttons with shanks are probably gaiter buttons. Gaiter buttons have flat or slightly rounded backs with white metal shank plates and wire loop shanks, are principally shaped like domes and cones, and most have white, brown, or black colored bodies. They range in size from 3/8 to 3/4 inch (Storm 1976; Luscomb 1967). Gaiter buttons were used to fasten dresses and coats as well as gaiters (Luscomb 1967).

J. Felix Bapterosses, a French engineer who had a patent for making porcelain buttons, established a factory in Briare, France about 1850. There he used machinery, which he had also patented, to produce gaiter buttons with distinctive shanks. As explained in Bapterosses' British patent dated 1857, the button bodies were molded with a place hollowed out for the shank. The hollows were grooved like a screw and recessed at the top. Fusible metal was placed on the hollows, melted, and the wire shanks were inserted into the cavities while the metal was still soft (Albert and Adams 1970). Three broken ceramic dome-shaped buttons from Harford Furnace have Bapterosses-type shanks (see Figure 65d).

Some buttons that have been identified as Prosser buttons may not have been made of porcelain. The presence of mold seams on the bottom at the edge, occasional bubbles, and occasional spots where material 'leaked' out of mold seams lead one to suspect that some were made of opaque white glass.

A close examination of buttons with broken surfaces created further uncertainty. Most of the broken surfaces looked granular and resembled hard paste porcelain in that there was no visible line between the glaze and the body. This granular texture extended uniformly through the button, eliminating the possibility that the texture was a result of partial crystallization of glass during cooling. If this was the case, one might have expected to see no crystallization at the edge of the button where it contacted the mold and some crystallization in the interior of the button where the molten glass would have had more time to cool. A few of the broken surfaces, however, closely resembled glass in their vitreosity and fracture behavior.

These observations lead one to strongly suspect that some of the buttons are porcelain and some are opaque white glass. Separating the two, however, becomes a very difficult and perplexing problem. Button collectors acknowledge this problem of material identification. In many instances buttons which might otherwise be mistaken for porcelain can be recognized as glass by the set of the shank. A rolled edge around a shank plate and covering part of it is impossible with porcelain, but regularly accomplished with glass. Material drawn up on the legs of a wire shank is glass. Beads of material filling the interstices of a rosette or box shank are glass (Albert and Adams 1959:109).

This information unfortunately does not help to determine whether a smooth sew-through button is porcelain or opaque white glass. Translucence appears to be an obvious distinguishing characteristic, but did not provide satisfying results in practice. Two buttons, one with a glassy broken surface and one with a granular broken surface were held up to the same light side by side and were seen to exhibit the same translucence. Three other non-destructive techniques were employed in attempts to separate porcelain and opaque white glass sew-through buttons: ultraviolet light, x-ray diffraction, and specific gravity.

Ultraviolet Test. No certain identification of material type could be made on the basis of an ultraviolet light test, because the range in variation was great. All of the buttons fluoresced in the light purple to ghostly white range which was within the range for soft paste porcelain according to information from Parks Canada (Jorgenson, personal communcation 1986). Objects known to be opaque white glass were observed to fluoresce in the light purple to ghostly white range also.

X-ray Diffraction Test. A second attempt was made to differentiate between opaque white glass and hard paste porcelain buttons using X-ray diffraction. The hypotheses in this test were that porcelain buttons, when bombarded with x-rays, would exhibit crystalline behavior in the kaolinite range and that glass buttons would exhibit no crystalline behavior.

Eleven complete buttons were tested with the X-ray diffractometer. In some cases, peaks of differing intensities were observed in the kaolinite range; in other cases, no activity was observed in that range. Certain questions, however, need to be considered before interpreting these results. For instance, there is uncertainty as to what, if any, effect the curved surface of the button has on the angle of diffraction of the X-rays. Some of the peaks may have been produced by interference of the x-rays with each other after bouncing off the curved surface. Some peaks may conceivably have been produced by bouncing off crystalline inclusions within a glass button. There is also uncertainty as to what distance into the button the X-rays penetrated. If the X-rays were deflected off of the surface, glassy behavior could have been observed on porcelain buttons, because they are glazed on the surface.

Specific Gravity Test. In another experiment, an attempt was made to differentiate between opaque white glass and hard paste porcelain buttons using specific gravity. At the outset, the expectation was that the data would fall into two separate, possibly overlapping ranges: one for milk glass and one for porcelain. The hypothesis was: If both opaque white glass and porcelain buttons were present in the sample, then the specific gravity data would display itself in two separate ranges.

A sensitive balance with the capability to weigh suspended objects was obtained. A length of fishing line was looped to the mechanism on the underside of the balance and a wire hook was secured to the free end of the line. Using this set up, a button hung on the wire hook was first weighed in air, then in water by raising a beaker of water from below with an adjustable platform. Care was taken to dislodge trapped air bubbles from the button, hook, and fishing line when weighing the button in water. Care was also taken to lower the button to the same depth each time the mass in water was measured.

Specific gravity for each button tested was then calculated to three significant figures using the formula:

$$\text{Specific Gravity} = \frac{\text{mass (air)}}{\text{mass (air)} - \text{mass (water)}}$$

Specific gravity was found in the same way for opaque white glass and porcelain vessel fragments. These were used as controls in the experiment.

The specific gravity was found for 39 randomly chosen buttons (Figure 66). Specific gravity was also found for seven opaque white glass and seven porcelain control samples. Specific gravities for both the buttons and the control samples

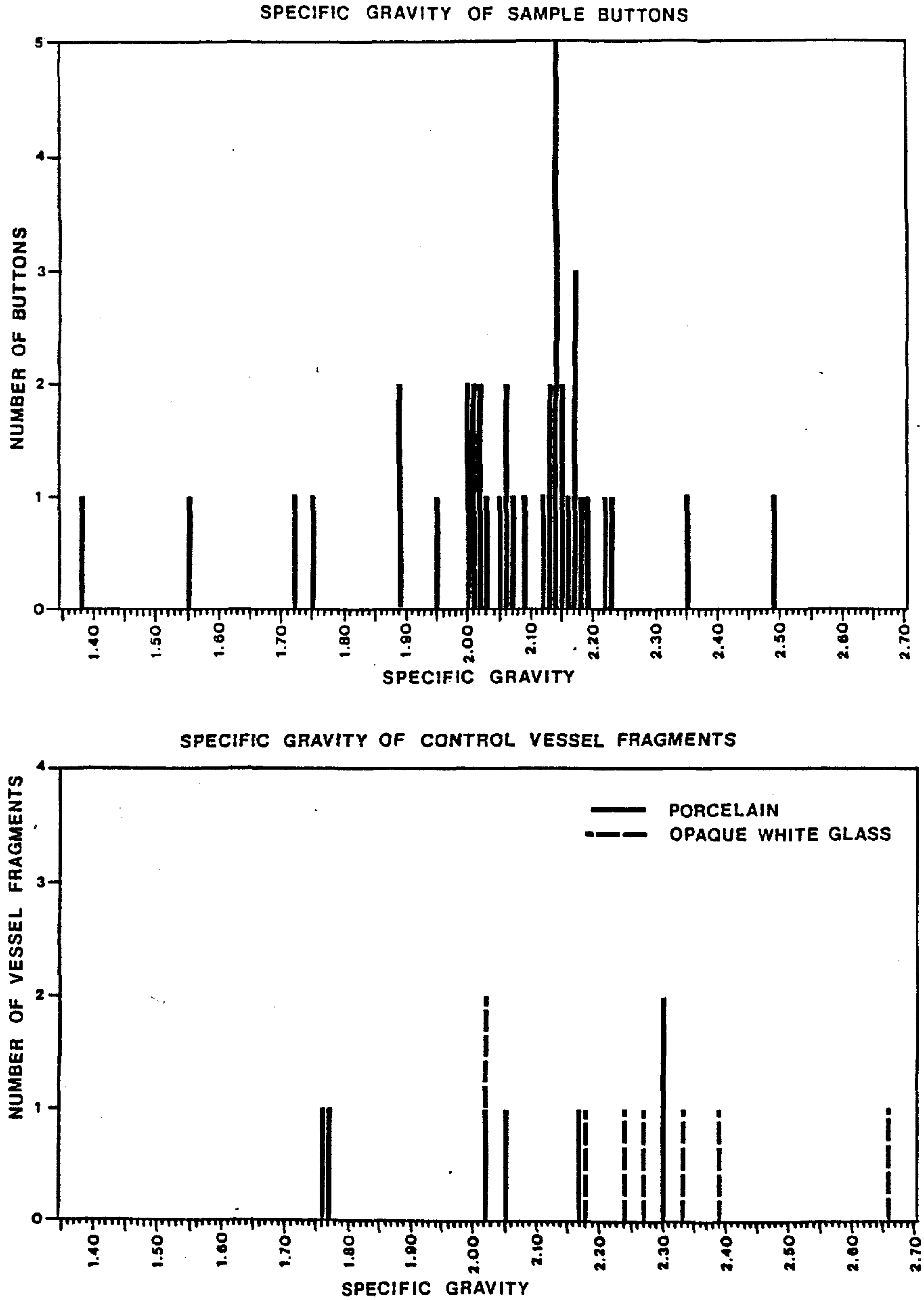


FIGURE 66. Specific gravity of sample buttons, control porcelain, and opaque white glass vessel fragments.

were expected to fall into two separate and distinct ranges, one which would be attributed to porcelain and one which could be attributed to opaque white glass. Each material was assumed to have a unique and narrow specific gravity range.

The specific gravities of the buttons, when plotted out, displayed a strong unimodal distribution over the 1.89 to 2.23 specific gravity range, peaking at 2.14. The values did not separate into two distinct ranges as expected.

The specific gravities of the porcelain controls ranged from 1.76 to 2.30 and the specific gravities of the opaque white glass controls ranged from 2.02 and 2.66. In general, the specific gravities of the porcelain controls tended to be lower than those of the opaque white glass controls. However, there was a wide range of overlap between the two materials, defined by specific gravity values of 2.02 to 2.30. An individual button having a specific gravity falling within this range could not be identified as one or the other material.

Twenty-six of the thirty-nine buttons tested (67%) had specific gravities that fell within the range of overlap established by the opaque white glass and porcelain control samples, and were therefore unidentifiable. It is likely that the eleven buttons with specific gravity values of less than 2.02 are porcelain, and that the two with specific gravity values higher than 2.30 are opaque white glass, but further control testing is necessary to determine with greater accuracy the upper limit of porcelain specific gravity and the lower limit of opaque white glass specific gravity. At present, the conclusion has to be that specific gravity is not a physical property that can be used to differentiate between porcelain and opaque white glass sew-through buttons.

Porcelain and opaque white glass were found to have similar specific gravities. The primary component of each is silica: chemically and texturally they are both fused silicates. The range of specific gravity values obtained for the two materials proved to be broad. The broad range can partially be explained by variety in material composition, such as the amount of flint and feldspar added to the kaolinite clay in porcelain, or the amount and kind of coloring agent added to the opaque white glass. Mineral and air bubble inclusions in the buttons and control samples can also partiallly account for the range of specific gravity values. The wide range of values may also suggest that sew-though buttons of both materials were present on the site.

It is not surprising that it has proven difficult to confidently separate buttons of the two materials. In texture, the body of high fired porcelain approaches glass. Porcelain, like glass, is translucent, the amount of translucence being related to the composition and firing temperature. The Prosser method for making buttons by compressing porcelain powder actually involved drying the clay before compressing it, to increase the translucence of the finished product.

The precise date for the initial making of molded opaque white glass buttons is not known. Cleland (1983) maintains that molded glass buttons were made in the late nineteenth and early twentieth centuries, apparently in imitation of pearl or porcelain buttons. Luscomb (1967) believes that molded glass buttons were made in the United States beginning in the 1840s. More work is needed to determine with confidence if a sew-through button is made of porcelain or opaque white glass and to determine if this has chronological significance.

Glass Buttons (see Table 59)

All of the glass buttons recovered were of solid molded glass with embedded wire shanks (Figure 67a through c). Those with Bapterosses-type shanks were assigned an initial date of manufacture of 1850. The manufacture of glass buttons flourished from the 1840s, but a few earlier glass buttons have been found (Luscomb 1967; Ford 1943). For this reason, and because glass buttons were made in parts of Europe much earlier than 1840, this was not listed as an initial manufacturing date. Two glass buttons were noted to have 'swirlbacks' - a cord-like winding off of the glass around the metal shank. 'Swirlbacks' are considered a by-product of the method of manufacture (Adams 1969), but no initial date of manufacture has been found for buttons with this characteristic.

One pressed button of black glass was found at Harford Furnace (Figure 67b). The popularity of jet buttons was brought about by Queen Victoria beginning in the 1860s and lasted for 30 or more years. "When Prince Albert died in 1861, Queen Victoria went into deep mourning. Respect for her mourning brought black into vogue, and the demand for jet buttons became so great that in Venice imitations were made of black glass and exported in great quantities to England and elsewhere" (Ford 1943:113). American glassmakers began to make black glass buttons in large quantities in the 1860s. These buttons were often advertised as 'genuine jet' on button cards until government laws restricted the use of misleading terms in advertising. Real jet, according to Albert (Couse and Maple 1941) was a hard, brittle substance akin to coal and was not used profusely in the making of buttons. Though the black pressed glass button was popular after 1860, the initial date of manufacture is 1827, a time of major change in pressed glass technology in the United States (Lee 1931).

Shell Buttons (see Tables 58 and 60)

Shell buttons, also called 'mother of pearl' or 'pearl' buttons, are made from ocean or freshwater shells (Figure 68a through e). They have been made for at least three centuries, so the initial manufacturing date is not helpful in dating the shell buttons from Harford Furnace. Perhaps eventually initial dates of manufacture can be assigned for shell buttons with specific types of shanks or decoration.

Bone Buttons (see Tables 61 and 62)

All the bone buttons recovered were sew-throughs (Figure 69f). Most had flat to slightly rounded backs, but deviations from this norm were noted individually in the descriptions. The bone buttons were divided in the tables into four-hole and five-hole groups, five-hole bone buttons having five holes arranged in the same configuration as the dots on the "5" face of a die. Both four- and five-hole bone buttons were made at least as early as the 18th century, often on-site, as evidenced by the presence of waste fragments of bones and partly made buttons at many fort sites (Ford 1943; Olsen 1963). Therefore, the initial date of manufacture for bone buttons cannot help in dating the bone buttons from the site.

The great majority of the four-hole bone buttons have indentations in the center front caused by lathe-turning (Figure 69c). The central holes of the 5-hole bone buttons are probably by-products of lathe turning, and could be indicators of a specific manufacturing technique.

TABLE 59. Glass buttons.

#	MATERIAL TYPE	FORM	DECORATION TYPE	HEIGHT (MM)	ADDITIONAL FORM AND DECORATION DESCRIPTION	AVG. MM	DIAMETER IN	LINES	INITIAL MANF. DATE	CONTEXT
1	GLASS	BALL-SHAPED	COLORED	11.0	TRANSPARENT AMBER GLASS WITH EMBEDDED WIRE SHANK	11.5	0.45	18		PLOWZONE
1	GLASS	BALL-SHAPED	COLORED	15.0	OPAQUE BLUE GLASS, GLASS HAS BEEN ROTATED WHILE IN MOLTEN STATE AROUND POINT WHERE WIRE SHANK IS EMBEDDED IN BACK	15.5	0.61	24		PLOWZONE
1	GLASS	DOME-SHAPED	COLORED	?	TRANSPARENT BLUE GLASS WITH BAPTEROSSES-TYPE SHANK	12.3	0.48	19	1857	PLOWZONE
2	GLASS	CONE-SHAPED	COLORED	6.8	OPAQUE BLACK GLASS WITH BAPTEROSSES-TYPE SHANK INSERTED IN KEY-SHAPED HOLE	12.9	0.508	20	1857	PLOWZONE
1	GLASS	CONE-SHAPED	COLORED	5.3	OPAQUE BLACK GLASS WITH EMBEDDED WIRE SHANK AND SHANK PLATE	8.8	0.35	14		PLOWZONE
1	GLASS	DOME-SHAPED	MOLDED	6.9	OPAQUE BROWN GLASS HAVING SHAPE RESEMBLING AN ACORN, 2 MM TWISTED BOARDER ENCIRCLES A CONVEX CENTER WITH 5-PART SYMMETRY. GLASS HAS BEEN ROTATED WHILE IN MOLTEN STATE AROUND POINT WHERE WIRE SHANK IS EMBEDDED IN BACK	10.8	0.425	17		PLOWZONE
1	GLASS	DOME-SHAPED	MOLDED	5.4	CLEAR GLASS, FLAT TOPPED DOME SHAPE WITH RAISED, GOLD-PAINTED CENTER CREATED BY AN IMPRESSED CIRCLE OF 3MM DIA. BACK HAS IMPRESSED 4-PETALLED FLOWER DESIGN AND AN EMBEDDED WIRE SHANK	14	0.55	22		PLOWZONE
1	GLASS	FLAT FRONT	MOLDED		OPAQUE BLACK GLASS WITH PRESSED DESIGN COMPOSED OF RAISED FACETED CIRCLES ARRANGED IN FOUR CONCENTRIC RINGS AROUND A CENTRAL CIRCLE OF 3.5 MM DIA. WIRE SHANK EMBEDDED IN 7 MM DIA. DOME ON BACK	18.2	0.715	28	1827	SLAG ROAD

FIGURE 67. Selected glass buttons and one ceramic button with Bapterrosses-type shank.

a.	Ball-shaped opaque blue button of solid glass with copper alloy wire shank, swirl back. Plowzone.
b.	Opaque black pressed glass button with design composed of raised faceted circles, wire shank missing. Slag road.
c.	Opaque brown glass acorn-shaped button with wire shank, swirl back. Plowzone.
d.	*Black porcelain gaiter button showing screw-thread like;* hollow for Bapterrosses-type shank. Plowzone.

FIGURE 68. Selected shell and black rubber buttons.

a and b.	2-hole shell sew-through buttons. Plowzone.
c and d.	4-hole shell sew-through buttons. Plowzone.
e.	4-hole shell sew-through with center missing. Feature 109.
f.	Molded black rubber button with wire shank and raised design of an 8-pointed star. Backmark reads "Goodyear's P=T. 1851. N.R.Co." Plowzone.
g	Z-hole molded black rubber sew-through. Backmark reads "Goodyear's P=T. 1851. N R Co." Plowzone.

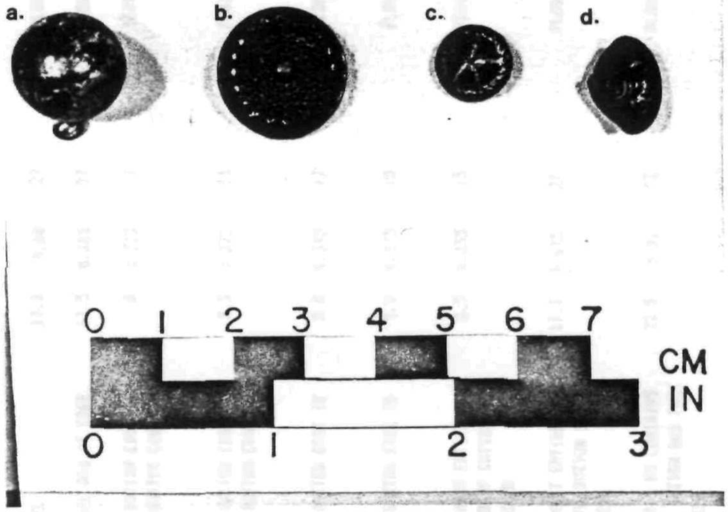


FIGURE 67. Selected glass buttons and one ceramic button with Bapterrosses-type shank.

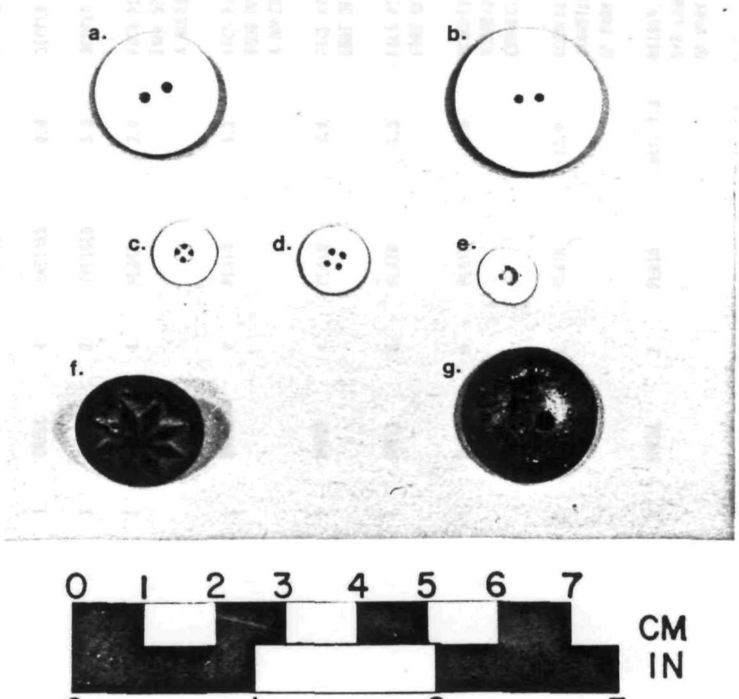


FIGURE 68. Selected shell and black rubber buttons.

TABLE 60. Shell sew-through buttons.

#	MATERIAL TYPE	NUMBER OF HOLES	DECORATION TYPE	PANEL DIAMETER (MM)	FORM AND DECORATION DESCRIPTION	AVG. MM	DIAMETER INCHES	LINES	INITIAL MANF. DATE	CONTEXT
1	SHELL	4	INCISED	4.0	INCISED LIGHTLY AT EDGE TO RESEMBLE TWISTED CORDS, 5 SETS OF 2 PARALLEL INCISIONS IN BORDER FORM STAR OR FLOWER DESIGN	9.8	0.375	15		PLOWZONE
1	SHELL	4	INCISED	4.5	SCORED CIRCLE AROUND PANEL	10	0.4	16		PLOWZONE
1	SHELL	4	INCISED	8.0	SCORED CIRCLE AROUND PANEL	17.3	0.68	27		PLOWZONE
1	SHELL	2	INCISED	5.5	SCORED CIRCLES AROUND PANEL AND AT EDGE	17.5	0.685	27		PLOWZONE
1	SHELL	4	PLAIN	3.0	FACE RISES SLIGHTLY FROM BUTTON EDGE TO EDGE OF PANEL, CENTER OF BUTTON CONNECTING 4 HOLES IS MISSING	8	0.313	12		FEATURE 109
1	SHELL	4	PLAIN	3.2	FACE RISES SLIGHTLY FROM BUTTON EDGE TO EDGE OF PANEL, CENTER OF BUTTON CONNECTING 4 HOLES IS MISSING	8.3	0.325	13		FEATURE 39/57
2	SHELL	4	PLAIN	3.0	FACE RISES SLIGHTLY FROM BUTTON EDGE TO EDGE OF PANEL	8.8	0.345	13		PLOWZONE
1	SHELL	4	PLAIN	3.5	FACE RISES SLIGHTLY FROM BUTTON EDGE TO EDGE OF PANEL	9.5	0.375	15		PLOWZONE
1	SHELL	4	PLAIN	7.5	SCOOPED PANEL TAKES UP ALMOST ENTIRE DIAMETER OF BUTTON, CENTER OF BUTTON CONNECTING 4 HOLES IS MISSING	8.5	0.335	13		FEATURE 109
1	SHELL	2	PLAIN	15.0	SCOOPED PANEL TAKES UP ALMOST ENTIRE DIAMETER OF BUTTON, BACK OF BUTTON HAS PART OF GRAY OUTER LAYER OF SHELL	17.3	0.675	27		PLOWZONE
1	SHELL	2	PLAIN	MAX: 7.0	RAISED, CONVEX CENTER OF 7.5 MM CONTAINS EYE-SHAPED PANEL, BACK OF BUTTON HAS PART OF GRAY OUTER LAYER OF SHELL	22.5	0.81	32		PLOWZONE
1	SHELL	4	PLAIN	?	PANEL DEFINITION HAS BEEN LOST DUE TO WEATHERING	9	0.35	14		PLOWZONE
1	SHELL	4	PLAIN	6.0		8.5	0.335	13		PLOWZONE
2	SHELL	4	PLAIN	6.0-7.0		14.5	0.57	22		PLOWZONE
1	SHELL	2	PLAIN		NO PANEL	15	0.585	23		PLOWZONE
1	SHELL	4	PLAIN		NO PANEL	9	0.355	14		PLOWZONE

TABLE 61. Bone four-hole sew-through buttons.

#	MATERIAL TYPE	NUMBER OF HOLES	DECORATION TYPE	PANEL DIAMETER (MM)	FORM AND DECORATION DESCRIPTION	AVG. MM	DIAMETER INCHES	LINES	INITIAL MANF. DATE	CONTEXT
1	BONE	4	STAINED	?	DARK BROWN, FLAT BORDER, INDENTATION IN CENTER OF PANEL, FRAGMENT	?	?	?		FEATURE 84
1	BONE	4	STAINED	9.0	DARK BROWN, RAISED ROUND BORDER	16	0.625	25		PLOWZONE
1	BONE	4	STAINED	7.0	DARK BROWN, FLAT BORDER, INDENTATION IN CENTER OF PANEL	17.2	0.675	27		PLOWZONE
1	BONE	4	STAINED	8.0	REDDISH BROWN, FLAT BORDER, INDENTATION IN CENTER OF PANEL	18.3	0.718	29		PLOWZONE
1	BONE	4	LATHE-TURNED	8.0	SCORED RING AROUND PANEL, FLAT BORDER	13	0.512	20		PLOWZONE
1	BONE	4	PLAIN	7.3	RAISED ROUND BORDER	10.1	0.4	16		PLOWZONE
1	BONE	4	PLAIN	10.0	RAISED ROUND BORDER	16	0.625	25		PLOWZONE
1	BONE	4	PLAIN	11.5	RAISED ROUND BORDER	16.6	0.655	26		PLOWZONE
1	BONE	4	PLAIN	6.3	ROUNDED BACK, FLAT FRONT, FLAT BORDER	13.7	0.535	21		PLOWZONE
1	BONE	4	PLAIN	7.0	ROUNDED BACK, FLAT FRONT, FLAT BORDER	16.4	0.642	25		FEATURE 31
1	BONE	4	PLAIN	15.5	ROUNDED BACK, RAISED ROUND BORDER	29	1.14	45		PLOWZONE
1	BONE	4	PLAIN		NO PANEL, ROUNDED BACK, CONCAVE FRONT, INDENTATION IN CENTER OF FRONT	17.6	0.69	27		FEATURE 82

TABLE 61 (Continued).

#	MATERIAL TYPE	NUMBER OF HOLES	DECORATION TYPE	PANEL DIAMETER (MM)	FORM AND DECORATION DESCRIPTION	AVG. MM	DIAMETER INCHES	LINES	INITIAL MANF. DATE	CONTEXT
2	BONE	4	PLAIN	5.5-6.5	FLAT BORDER, INDENTATION IN CENTER OF PANEL	12.4	0.485	19		PLOWZONE
2	BONE	4	PLAIN	6.0-7.0	FLAT BORDER, INDENTATION IN CENTER OF PANEL	13.5	0.53	21		PLOWZONE
1	BONE	4	PLAIN	6.0	FLAT BORDER, INDENTATION IN CENTER OF PANEL	13.9	0.545	21		PLOWZONE
4	BONE	4	PLAIN	7.3-8.0	FLAT BORDER, INDENTATION IN CENTER OF PANEL	16.6	0.65	26		PLOWZONE
2	BONE	4	PLAIN	6.8-7.8	FLAT BORDER, INDENTATION IN CENTER OF PANEL	16.8	0.66	26		PLOWZONE
1	BONE	4	PLAIN	6.8	FLAT BORDER, INDENTATION IN CENTER OF PANEL	16.8	0.66	26		FEATURE 57
3	BONE	4	PLAIN	7.4-9.3	FLAT BORDER, SUNKEN PANEL EXTENDS TO OF PANEL	17	0.67	26		PLOWZONE
2	BONE	4	PLAIN	7.7-8.0	FLAT BORDER, SUNKEN PANEL EXTENDS TO OF PANEL	17.2	0.675	27		PLOWZONE
3	BONE	4	PLAIN	7.6-9.3	FLAT BORDER, SUNKEN PANEL EXTENDS TO OF PANEL	17.5	0.685	27		PLOWZONE
1	BONE	4	PLAIN	?	FLAT BORDER, SUNKEN PANEL, RAISED PANEL ON BACK	17.5	0.685	27		PLOWZONE
1	BONE	4	PLAIN	7.5	FLAT BORDER	15.6	0.615	24		PLOWZONE
1	BONE	4	PLAIN	6.8	FLAT BORDER	16.7	0.657	26		FEATURE 39/57
1	BONE	4	PLAIN	7.5	FLAT BORDER	16.9	0.665	26		PLOWZONE
1	BONE	4	PLAIN	?	FLAT BORDER, FRAGMENT	17.8	0.7	28		PLOWZONE
2	BONE		PLAIN	?	FRAGMENTS	?	?	?		RELICT CREEK

TABLE 62. Bone five-hole sew-through buttons.

#	MATERIAL TYPE	NUMBER OF HOLES	DECORATION TYPE	PANEL DIAMETER (MM)	FORM AND DECORATION DESCRIPTION	AVG. MM	DIAMETER INCHES	LINES	INITIAL MANF. DATE	PROVENIENCE
1	BONE	5	STAINED AND LATHE-TURNED	11.0	ORANGE, RAISED RING AROUND CENTER HOLE, THIN RAISED RING AROUND PANEL FOLLOWED BY RAISED ROUND BORDER	16	0.635	25		FEATURE 119
1	BONE	5	STAINED AND LATHE-TURNED	8.8	DARK BROWN, THIN RAISED RING AROUND PANEL FOLLOWED BY A RAISED ROUND BORDER	16.5	0.65	26		FEATURE 25
1	BONE	5	STAINED AND LATHE-TURNED	7.2	DARK BROWN, 2 MM RAISED ROUND BORDER FOLLOWED BY RAISED ROUND EDGE OF 2.5 MM	16.5	0.65	26		FEATURE 72
1	BONE	5	STAINED AND LATHE-TURNED	8.5	DARK BROWN, RAISED ROUND BORDER FOLLOWED BY RAISED ROUND EDGE OF .8 MM	17.5	0.685	27		FEATURE 65
1	BONE	5	LATHE-TURNED	9.8	OFF-CENTER PANEL, RAISED RING AROUND CENTER HOLE, RAISED ROUND BORDER	13.2	0.517	20		PLOWZONE
2	BONE	5	LATHE-TURNED	13.7	RAISED RING AROUND CENTER HOLE, 2 THIN RAISED RINGS AROUND PANEL FOLLOWED BY A RAISED FLAT BORDER	16.6	0.65	26		PLOWZONE
1	BONE	5	LATHE-TURNED	7.3	THIN RAISED RING AROUND PANEL FOLLOWED BY A RAISED ROUND BORDER	14.3	0.56	22		PLOWZONE
2	BONE	5	LATHE-TURNED	8.0-8.8	THIN RAISED RING AROUND PANEL FOLLOWED BY A RAISED ROUND BORDER	16.6	0.65	26		PLOWZONE
1	BONE	5	LATHE-TURNED	8.0-8.8	THIN RAISED RING AROUND PANEL FOLLOWED BY A RAISED ROUND BORDER	16.6	0.65	26		FEATURE 109
1	BONE	5	LATHE-TURNED	8.0-8.8	THIN RAISED RING AROUND PANEL FOLLOWED BY A RAISED ROUND BORDER, BORDER IS PIERCED BY A HOLE WHICH EXTENDS ALMOST ALL THE WAY THROUGH	16.6	0.65	26		FEATURE 119
1	BONE	5	LATHE-TURNED	8.0	THIN RAISED RING AROUND PANEL FOLLOWED BY A RAISED ROUND BORDER	17.2	0.675	27		PLOWZONE
1	BONE	5	LATHE-TURNED	8.3	THIN RAISED RING AROUND PANEL FOLLOWED BY A RAISED FLAT BORDER	17.4	0.68	27		PLOWZONE
1	BONE	5	PLAIN	?	RAISED ROUND BORDER, DEFORMED IN SHAPE	?	?	?		FEATURE 31
1	BONE	5	PLAIN	6.4	RAISED ROUND BORDER	12	0.467	18		FEATURE 109
1	BONE	5	PLAIN	7.0	RAISED RING AROUND CENTER HOLE, FLAT BORDER	17.2	0.675	27		PLOWZONE
1	BONE	5	PLAIN	5.0	FLAT BORDER	10.7	0.42	16		PLOWZONE
4	BONE	?	PLAIN	?	FRAGMENTS	?	?	?		PLOWZONE

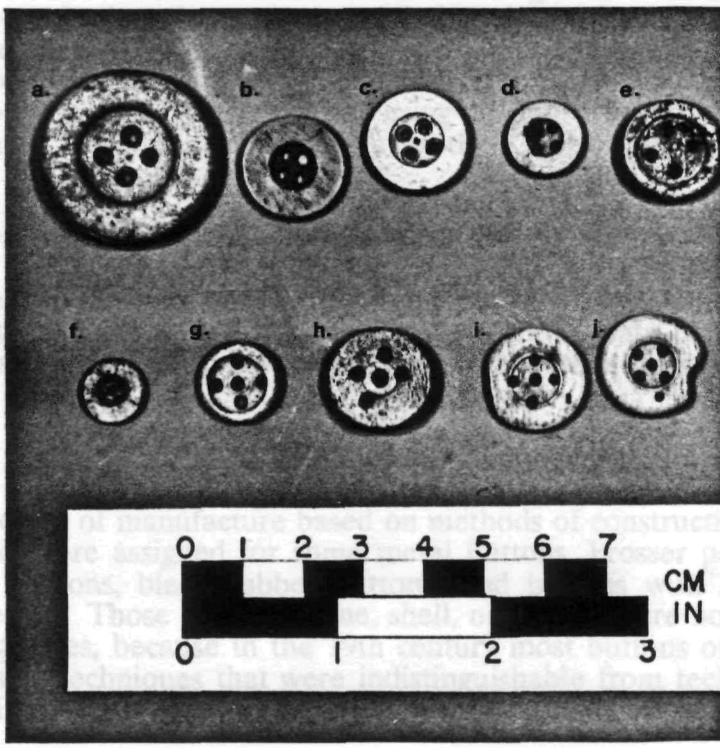


FIGURE 69. Selected bone buttons.

The decoration on bone buttons is described in the tables as stained, lathe-turned, or plain. The U.S. Tariff Commission (1918) noted that bone buttons were made up in black and the natural color only, as bonè was not well adapted to coloring. Most of the colored bone buttons recovered from Harford Furnace were dark brown, some had reddish or orange tints. The word 'plain,' used in the tables to describe decoration, means that the buttons had no decoration and were of natural color. 'Lathe-turned' decoration is meant to describe a series of raised and depressed rings circling the panel of a bone button from the border to the edge.

Black Rubber Buttons (see Tables 58 and 63)

Seven molded black rubber buttons were recovered (Figure 68f and g). One had a metal shank and six were four-hole sew-throughs. Five out of the seven had raised Goodyear backmarks, some proclaiming the patent date of 1851. These backmarks, reading "GOODYEAR'S P=T N.R.Co." are the signature of the Novelty Rubber Company of New York and New Brunswick, New Jersey. The Novelty Rubber Company made buttons using an improved process for hardening rubber, patented by Charles Goodyear's brother, Nelson, in 1851 (Hughes and Lester 1981).

Leather Buttons (see Table 58)

Two leather buttons were recovered; one was dome-shaped and the other was flat. Both had embedded wire shanks. No initial date of manufacture was assigned - these buttons could have been made by a leather worker or shoemaker in the area.

Dating of the Button Assemblage

Initial dates of manufacture based on methods of construction, patent dates, and backmarks were assigned for some metal buttons, Prosser porcelain buttons, pressed glass buttons, black rubber buttons, and buttons with Bapterosses-type shanks (Table 64). Those made of bone, shell, or leather were not assigned initial manufacturing dates, because in the 19th century most buttons of these materials were made using techniques that were indistinguishable from techniques that had already been in use for a century or more.

The set of buttons recovered from the relict creek bed's well-dated, quickly deposited context outlines a group of button styles used simultaneously during the period 1830-1845. The dates of manufacture for the pewter button manufactured by Anson Matthews (in business from 1806 - 1830) and the Jacksonian-like button (which enjoyed popularity from 1815 - 1850) support the date indicated for the relict creek bed deposit by ceramic makers', glass bottles, shoes, and other artifacts in the deposit. The lack of Prosser buttons (patent date 1840) recovered from the creek supports a sealing of the deposit by slag soon after 1840. Prosser buttons experienced tremendous radiation in popularity soon after their invention, and were found everywhere on the site except in the creek bed.

Analysis of the Button Assemblage

Two hundred thirty eight total buttons were recovered from all contexts at Harford Furnace including the creek deposit. It is not certain that the artifacts from the relict creek bed were deposited exclusively by the occupants of the house, but it is reasonable to assume that the house occupants contributed to the deposit. For

TABLE 63. Black rubber sew-through buttons.

#	MATERIAL TYPE	NUMBER OF HOLES	DECORATION TYPE	PANEL DIAMETER (MM)	FORM AND DECORATION DESCRIPTION	AVG. DIAMETER MM	AVG. DIAMETER INCHES	LINES	INITIAL MANF. DATE	CONTEXT
1	B. RUBBER	4	PLAIN		FLATTENED, NO PANEL, RAISED BACK-MARK READS: GOODYEAR'S P___N R Co	15.4	0.6	24	1851	PLOWZONE
1	B. RUBBER	2	MOLDED	6.0	RAISED RING AROUND PANEL, BORDER DECORATED WITH EVENLY SPACED CIRCLES SURROUNDING DOTS, RAISED RING AT EDGE, RAISED BACKMARK READS: GOODYEAR'S P=T.N R Co	15.5	0.607	24	1851	FEATURE 72
1	B. RUBBER	2	PLAIN	6.0	TRUNCATED DOME-SHAPED BUTTON WITH FLAT BACK AND DEEP SUNKEN PANEL, DOME HT.= 6.1 MM	17.6	0.693	28		PLOWZONE
1	B. RUBBER	2	MOLDED	6.4	THIN RAISED RING AROUND PANEL, BORDER DECORATED WITH RING OF INDENTED DOTS, BACKMARK READS: GOODYEAR'S P T______	18.4	0.725	29	1851	PLOWZONE
1	B. RUBBER	2	MOLDED		NO PANEL, INDENTED RING AT EDGE	18.4	0.725	29		PLOWZONE
1	B. RUBBER	2	PLAIN	15.0	SCOOPED PANEL TAKES UP ALMOST ENTIRE WIDTH OF BUTTON, FLAT 2.5 MM BORDER, RAISED BACKMARK READS: GOODYEAR'S P=T. 1851. N R Co	18.9	0.74	30	1851	PLOWZONE

TABLE 64. Initial dates of manufacture for buttons.

Material	Button Type	Initial Date of Manufacture	Source
cu-alloy	2-piece gilded with stamped backmark (Omega type)	1790 (British patent)	Johnson (1948)
cu-alloy	3-piece gilded (Sanders type)	1823 (British patent)	Johnson (1948)
cu-alloy	4-piece gilded (Staff type)	1832	Johnson (1948)
cu-alloy	2-piece gilded with coined decoration	1830	Luscomb (1967) Johnson (1948)
porcelain	Prosser	1840 (British Patent)	Adams (1961) Storm (1976)
ceramic	Buttons with Bapterosses-type shanks	1857 (British Patent)	Lorah (1959) Schuler and Lamm (1960)
glass	Pressed glass	1827 (American (Patent)	Lee (1931)
black rubber	Molded	1851 (U.S. Patent)	Backmark on button

this reason and because there were only nine buttons recovered from the creek, it was decided, for the purposes of the following analyses, to group all buttons from the Harford Furnace site together. The total assemblage is assumed to be a representative sample of the buttons worn by iron furnace workers and their families from ca. 1831 to 1880.

The material type of the total assemblage by percent is:

42%	ceramic (38% Prosser, 4% Gaiter and non-Prossers)
26%	bone
15%	metal
9%	shell
4%	glass
3%	black rubber
1%	leather

Ceramic, bone, and metal were the three major material types from which the buttons at Harford Furnace were made. These predominant materials are all durable, a quality which would be required for the work clothing of iron furnace workers, and those keeping house. Buttons of less durable materials such as shell and leather are not entirely absent, but are present in smaller quantities than the more durable materials. The presence of durable decorative glass buttons alone indicates that all clothing worn by workers in the Harford Furnace area was not work clothing. Indeed, the decoration descriptions of the glass, metal, and Prosser buttons suggest that a reasonable number of the buttons recovered were probably not used to fasten work clothing. Assuming that the buttons on the site in a broad sense reflect the kinds of clothing worn by iron furnace workers and their families, it appears that some of the clothing worn was relatively fancy.

Percentages of decorated and undecorated buttons were determined for the buttons recovered from Harford Furnace (Table 65). Approximately 38% of the buttons were decorated and 62% were plain. A substantial percentage of buttons within each material or style group had some type of decoration that set them apart from the plain variety within each material or style group. That nearly 2/5 of the buttons deposited by the site occupants were decorated may reflect the availability of relatively cheap mass-produced decorated buttons for purchase. Iron furnace workers and the members of their households may also have had money to buy decorated buttons in addition to plain buttons, and had some clothing that was not normally used for work.

No attempt was made to differentiate between buttons used on men's, women's, or children's clothing. Though specific button styles can occasionally be determined with high probability to have specific functions, more often than not a particular style has multiple uses. "Garments of calico with calico buttons," for example, "were made for the whole family - baby, daughter, son, mother, and father" (Luscomb 1967:31).

A distribution analysis was completed to determine how the buttons grouped according to size (Figure 70a through c). The vast majority of the buttons measured in the 8-19 mm size range and dwindling numbers measured in the 20-29 mm size range (Figure 70a). Sew-through buttons were present in greater numbers than the shanked buttons in all sizes except in the 19-24 mm size range. The assemblage separated into four modes, each mode defining a set of buttons. Two strong modes fell into the 7-12 and 15-18 mm size ranges and peaked at 10-11 mm and 16-17 mm

TABLE 65. Frequency of decorated and plain buttons by material or style group.

MATERIAL OR STYLE GROUP	DEFINITION OF DECORATED / DEFINITION OF PLAIN (DECOR) (PLAIN)	# DECORATED	# PLAIN	% DECORATED	% PLAIN
METAL	DECOR: ALL GILDED METAL BUTTONS WITH DEVICES, FABRIC COVERED BUTTONS AND METAL SEW-THROUGH BUTTONS WITH STAMPED DECORATIONS ON THE BORDERS PLAIN: PLAIN GILDED BUTTONS, SEW-THROUGHS WITH UNDECORATED BORDERS	16	21	6.72%	8.82%
PORCELAIN (PROSSER)	DECOR: CALICO, BANDED, COLORED BODY, INKWELL-SHAPED AND BUTTONS WITH MOLDED BORDERS PLAIN: PLAIN WHITE BUTTONS	30	61	12.61%	25.63%
CERAMIC (NON-PROSSERS)	DECOR: COLORED BODY BUTTONS PLAIN: PLAIN WHITE BUTTONS	7	3	2.94%	1.26%
GLASS	DECOR: COLORED BUTTONS OR BUTTONS WITH MOLDED DECORATION PLAIN: BLACK OR WHITE GLASS BUTTONS	9	0	3.78%	0.00%
SHELL	DECOR: INCISED BUTTONS AND BUTTONS WITH RAISED CONVEX CENTERS PLAIN: PLAIN SMOOTH POLISHED BUTTONS	5	16	2.10%	6.72%
BONE	DECOR: STAINED BUTTONS AND BUTTONS WITH LATHE-TURNED DECORATION PLAIN: NATURAL COLORED	19	42	7.98%	17.65%
BLACK RUBBER	DECOR: BUTTONS WITH MOLDED DECORATION PLAIN: PLAIN BLACK RUBBER BUTTONS	4	3	1.68%	1.26%
LEATHER	DECOR: INCISED OR STAMPED LEATHER BUTTONS PLAIN: PLAIN LEATHER BUTTONS	0	2	0.00%	0.84%
	TOTAL BUTTONS IN SAMPLE: 238 SUBTOTALS	90	148	37.82%	62.18%

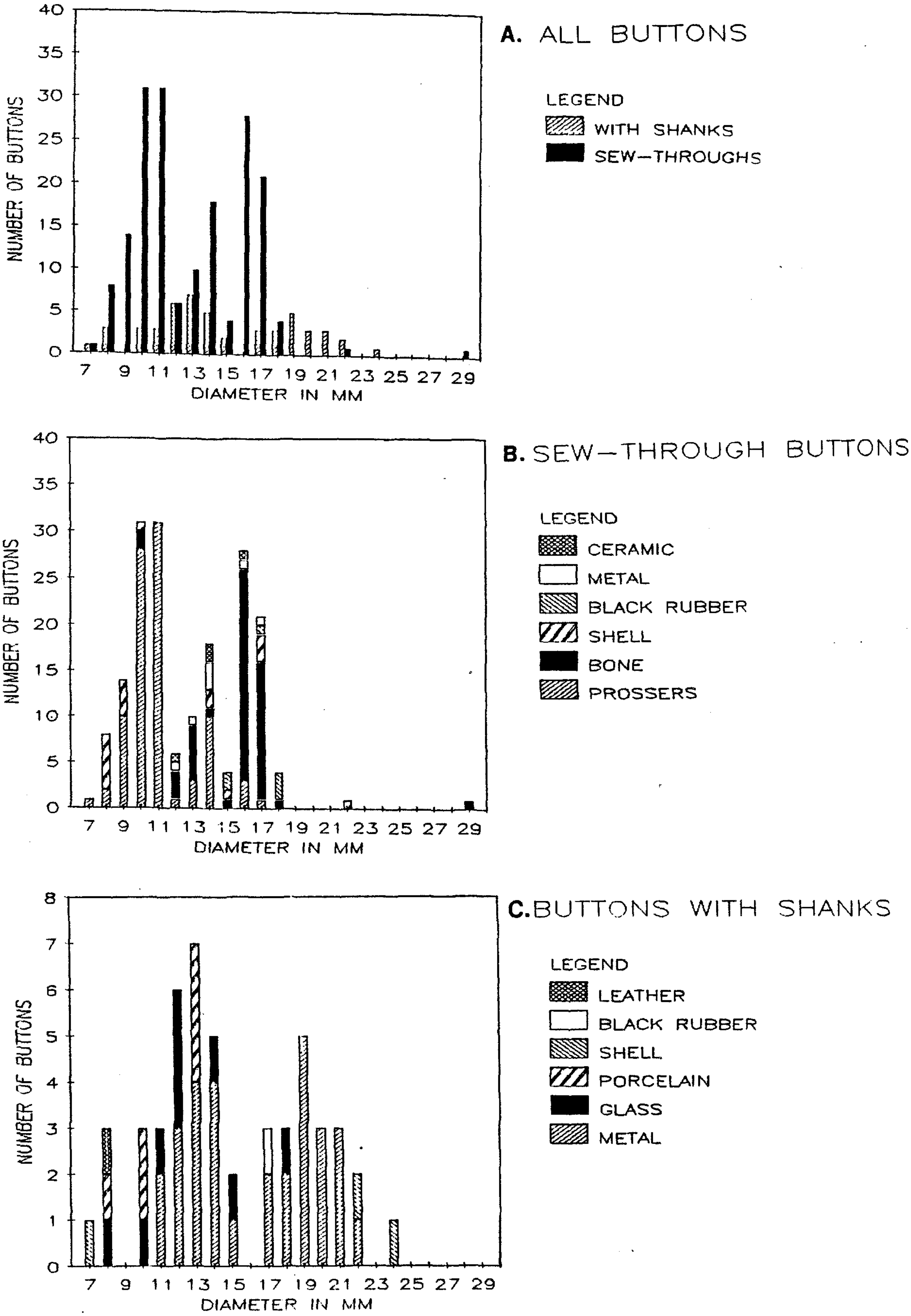


FIGURE 70. **Size distribution of buttons from Harford Furnace showing all buttons, sew-throughs, and buttons with shanks.**

respectively. A third mode occurred in the 12-15 mm size range and peaked at 14 mm, and a fourth mode, outlining the set of the largest buttons on the site, covered the 17-29 mm range and peaked at 19 mm.

The size distribution of sew-through buttons by material group show how material is related to size (Figure 70b). Prosser buttons are almost entirely responsible for the strong mode peaking at 10-11 mm: in fact, they are essentially the only sew-through button type present in the 10-11 mm size range. "After the invention of porcelain buttons in the 1840s extensive use was made of these and shell buttons for shirts..." (South 1964:132). The "extensive use" of Prosser buttons becomes apparent when it is noted that they make up 38% of the total buttons at Harford Furnace, 29% of the buttons from the Fort Fischer ruin (South 1964), and 33% of the buttons from Kanaka Village/Vancouver Barracks (Chance and Chance 1976).

The high number of Prosser buttons occurring at Harford Furnace is probably related to the fact that they can be used on a variety of garments such as work and dress shirts, dresses, and underwear. Normally, large numbers of buttons are used on the sleeves, collars, pockets, backs, and fronts of these garments. Sew-through buttons in the 10-11 mm size range are particularly good for shirts, dresses, and underwear. Assuming that there was no sample bias created by the relative stability of porcelain and shell in the ground, Prosser buttons become quite clearly the most commonly used sew-through in the 10-11 mm size range at Harford Furnace. It may be that porcelain buttons were preferred over shell buttons because they were cheaper and more durable.

Shell buttons were made in a variety of sizes for a variety of purposes - "from tiny ones for infants clothing to extra-large ones for coats" (Luscomb 1967:180). Shell sew-throughs occur in small quantities and a range of diameters, with only one shell sew-through button occurring in the 10-11 mm size range (Figure 70b). It is certain that shell buttons were made in that size because it is particularly good for underwear, shirts, and dresses. It is possible that shell buttons were used less often because they were less durable than Prosser buttons. In support of this statement, three shell buttons recovered from the site were missing the center portions between the four holes. They had popped off while still attached to the clothing; no Prosser buttons showed evidence of having broken in this manner.

Another possible explanation for why shell buttons appear less frequently than porcelain buttons is that they were more expensive. During the time the Harford Furnace property was occupied, most shell buttons were made of "mother of pearl" (ocean shell) because the fresh water pearl (fresh water shell) button industry had not yet surfaced. That industry began in the U.S. in 1891, and by 1900 it had become the second most important branch of the U.S. button industry (Josephsson 1908).

Bone sew-throughs occur in smaller numbers in other sizes, but the vast majority of them fall into the 16-17 mm size range (the second strong mode in Figure 70b). Bone sew-throughs were durable, utilitarian buttons which could be used on a variety of garments such as underwear, trousers, and vests. Sew through buttons in the 16-17 mm size range are perfectly suitable for use on these kinds of garments. Bone buttons were purchased in bulk and were probably one of the cheapest and most adaptable buttons available in the 19th century.

The third mode to be discussed in the sew-through button size distribution analysis (Figure 70), covering the 12-15 mm size range and peaking at 14 mm, is composed of buttons of several different materials. This mode roughly coincides with a mode of shanked buttons (Figure 70c) covering the 10-15 mm size range and peaking at 13 mm. No button material group greatly outnumbers another in this mode. This pattern differs significantly from the patterns exhibited by the Prosser buttons in the 10-11 mm range and the bone buttons in the 16-17 mm range.

Button diversity in this mode is represented by Prossers, metal buttons with shanks, metal sew-throughs, ceramic, shell, black rubber, and bone sew-throughs, molded glass buttons, and gaiter buttons. The functions suitable to these buttons are as diverse as the button styles. The Prossers in this size range could be used for vests, jackets, or trousers. The metal buttons with shanks are probably best suited to vests, jackets, or dresses. The molded glass buttons are probably women's dress or jacket buttons, the gaiter buttons could double on dresses or jackets. Some of the button styles in this third mode serve many purposes, others, such as those of molded glass, are somewhat limited to women's or girl's dresses or jackets. Quite a few of the decorated buttons from Harford Furnace, including embossed metal buttons with shanks and glass buttons, fall into this size group.

The fourth and last mode to be discussed in the size distribution analysis defines the set of the largest buttons found on the site. This group of buttons ranges in size from 18 to 29 mm and peaks at 19 mm. This is the only mode in the size distribution analysis where shanked buttons outnumber sew-throughs. The group is largely composed of metal buttons with shanks but also contains buttons of glass, shell, black rubber, and a very large bone sew-through (Figure 70c). The buttons in this group were probably used exclusively on jackets and overcoats.

Summary

The button assemblage recovered from Harford Furnace represents a sample of buttons worn by iron furnace workers and their families from ca. 1831-1880. Prosser buttons and bone sew-throughs are the types which occurred most frequently on the site. Prosser buttons, essentially the only buttons present on the site in the 10-11 mm size range, were preferred over shell buttons. Bone sew-throughs, present in particularly large quantities in the 16-17 mm size range, were the preferred sew-through button in that size range. Along side these durable, multi-purpose Prosser and bone sew-through buttons a population of decorated buttons was found. These decorated buttons comprised close to 2/5 of the entire assemblage and were probably not used on work clothing.

One of the most striking characteristics of the button assemblage is the diversity of materials and styles present. In part, this represents diversity of activity of iron furnace workers and their families over time. The military buttons indicate involvement in the Dragoon, Cavalry, General Staff, and possibly Militia divisions of the land forces. The decorative buttons point to activities unrelated to work at the iron furnace or in the home such as trips to town, or attending church, school and special community events. The dominant button types in the assemblage, plain Prosser sew-throughs and lathe-turned four- and five-hole bone buttons, were the utilitarian styles most used by iron furnace workers and their families for work and dress clothing.

General Button Terminology [Adapted in part from Storm (1976) and Luscomb (1967)].

Backmark	A maker's name or slogan stamped or molded on the back of a button. A backmark is stamped and impressed unless otherwise indicated.
Border	That portion of the face or back which delineates or encompasses the device or the panel (p. 120).
Button height	Listed for convex, ball, dome and cone-shaped buttons, but not for flat buttons. Button height is measured from the highest point on the back to the highest point on the front; usually from center back to center front.
Chasing	Decorating metal with a hammer and blunt tools.
Coining	A method for decorating buttons where the design was stamped on the front and back at the same time, before the shank was attached.
Compound Metal	Metal buttons with separate parts composed of different metal alloys. Those from Harford Furnace have copper alloy fronts and iron backs.
Convex	Describes button form when the curve of the front is slight compared to a dome shape.
Device	Incisions, embossed patterns, printing by manufacturers, the U.S. Army Eagle or the designs found on 'Calicoes' (p. 120).
Dome shaped	A button form which approximates a hemisphere. In cross section, the curved front of a dome shaped button meets the edge in a right angle.
Edge	That portion outside the border which may either be plain or a secondary border but, ultimately, is the extent of the button itself (p. 120).
Panel	The very center portion of a sew-through which contains the holes. It may be sunken, raised, scooped, bowl-shaped, or may constitute the button itself within a raised, round border (p. 121).
Right or Left	Refers to the right or left of the button wearer.
Rim	A separate piece of metal which is attached to a button edge either as decoration or to hold the face to the back or shank portion (p. 120).

Sew-through	A button with two, three, or four holes through which a needle with thread is passed to secure the button to a garment (p. 121). All of .the sew-throughs from Harford Furnace, regardless of material, had flat to slightly rounded backs and flat to slightly rounded fronts unless otherwise indicated.
Shank	A piece added to a button for the purpose of attaching the button to a garment. Shanks can be made of wire of any metal - the shanks on buttons from Harford Furnace are all wire loop shanks. Several inventions were patented for attaching loop shanks to buttons (Luscomb 1967).
Shank Plate	A metal disk to which a shank has been applied. The shank can be put through a hole in the plate, and the ends of the shank fastened on the inside. Shank plates with shanks attached in this manner are usually found on buttons made of moldable materials, and are embedded in the backs of the buttons (Luscomb 1967).

APPENDIX XI

CERAMIC VESSELS

by Silas D. Hurry

APPENDIX XI
CERAMIC VESSELS

The following tables (Tables 66 and 67) summarize the results of the ceramic vessel analysis undertaken with the material recovered from the Harford Furnace site. The vessels are segregated into two study groups: those recovered from around the domestic structure and those recovered from the creek deposit. The ware-type description follows the standards established by Nöel Hume (1969). Decoration is described following the emic typology forwarded by George Miller (1980) based on potters' terminology. Vessel completeness is also noted following a modified form of the method proposed by Fine (1982): Class "A" vessels are complete from rim to base, Class "B" vessels are represented by rims only, Class "C" vessels are represented by both rim and base which do not mend, Class "D" vessels are represented by basal sherds which cannot be associated with a rim, and Class "E" vessels are unique body sherds not attributable to either a rim or base. Vessel form is described using the standard form terms used by ceramicists and archeologists (primarily cup, saucer, plate, and bowl) and have implicit functional attributes. Additional, specialized forms are identified when possible (platters, creamers, etc.) and three general categories, flat, hollow, and "?" are utilized for vessels whose functional forms could not be determined with any degree of certainty (generally extremely fragmentary vessels).

TABLE 66. **Ceramic vessel analysis - house area.**

VESSEL NUMBER	FORM	WARE	DECORATION	CLASS	MOTIF	COLOR
3	CUP	WHITEWARE	TRANSFER	B	FOLIATE	BLUE
4	BOWL	WHITEWARE	TRANSFER	C	FLORAL	BLUE
7	BOWL	WHITEWARE	TRANSFER	B	FLORAL	BLUE
8	PITCHER	WHITEWARE	TRANSFER	B	FLORAL	GREEN
9	FLAT	WHITEWARE	TRANSFER	B	FLORAL	BLUE
12	?	WHITEWARE	TRANSFER	B	FLORAL	BLUE
13	PLATE	WHITEWARE	TRANSFER	D	LANDSCAPE/GEOMETRIC	BLUE
14	HOLLOW	WHITEWARE	TRANSFER	E	GEOMETRIC/LANDSCAPE	BLUE
16	SAUCER	WHITEWARE	TRANSFER	B	FLORAL/GEOMETRIC	BLUE
18	PLATE	WHITEWARE	TRANSFER	C	FLORAL	GREEN
19	FLAT	WHITEWARE	TRANSFER	B	LANDSCAPE/GEOMETRIC	GREEN
21	FLAT	WHITEWARE	TRANSFER	B	FOLIATE	BLUE
22	HOLLOW	WHITEWARE	TRANSFER	E	FOLIATE	BLUE
25	HOLLOW	WHITEWARE	TRANSFER	C	GEOMETRIC	GREEN
30	COFFEE POT	WHITEWARE	TRANSFER	D	GEOMETIC/LANDSCAPE	BLUE
32	PLATE	WHITEWARE	TRANSFER	B	FOLIATE FLOW	BLUE
33	FLAT	WHITEWARE	TRANSFER	C	GEOMETRIC	BLUE
34	TUREEN	WHITEWARE	TRANSFER	E	FOLIATE	BLUE
35	FLAT	WHITEWARE	TRANSFER	B	FLORAL/GEOMETRIC	BLUE
36	PLATE	WHITEWARE	TRANSFER	B	FOLIATE	BLUE
38	PLATE	WHITEWARE	TRANSFER	B	LANDSCAPE/FOLIATE	BLUE
39	HOLLOW	WHITEWARE	TRANSFER	B	GEOMETRIC/LANDSCAPE	BLUE
40	PLATE	WHITEWARE	TRANSFER	B	FLORAL/GEOMETRIC	BLUE
41	HOLLOW	WHITEWARE	TRANSFER	B	FLORAL/GEOMETRIC	BLUE
42	BOWL	WHITEWARE	TRANSFER	D	GEOMETRIC/LANDSCAPE	PURPLE
43	PLATE	WHITEWARE	TRANSFER	A	FLORAL/LANDSCAPE	BLUE
44	HOLLOW	WHITEWARE	TRANSFER	C	LANDSCAPE	BLUE
45	PLATE	WHITEWARE	TRANSFER	B	FLORAL	BLUE
46	PLATE	WHITEWARE	TRANSFER	C	RELIGIOUS	BLUE
47	PLATE	WHITEWARE	TRANSFER	C	RELIGIOUS	BLUE
48	PLATE	WHITEWARE	TRANSFER	B	FOLIATE	BLUE
49	HOLLOW	WHITEWARE	TRANSFER	E	FOLIATE	BLUE
50	PLATE	WHITEWARE	TRANSFER	B	GEOMETRIC	BLUE
51	PLATE	WHITEWARE	TRANSFER	E	GEOMETRIC/LANDSCAPE	BLUE
52	BOAT	WHITEWARE	TRANSFER	B	GEOMETRIC/LANDSCAPE	BLUE
55	BOWL	WHITEWARE	TRANSFER	C	FLORAL	BLUE
56	HOLLOW	WHITEWARE	TRANSFER	B	GEOMETRIC/LANDSCAPE	PURPLE
60	PLATE	WHITEWARE	TRANSFER	B	GEOMETRIC	BLUE
61	PLATE	WHITEWARE	TRANSFER	B	FOLIATE/GEOMETRIC	BLUE
62	HOLLOW	WHITEWARE	TRANSFER	E	LANDSCAPE/CHINSOIRE	BLUE
64	HOLLOW	WHITEWARE	TRANSFER	B	LANDSCAPE	BLUE
65	HOLLOW	WHITEWARE	TRANSFER	B	GEOMETRIC/LANDSCAPE	BLUE
67	PLATE	WHITEWARE	TRANSFER	B	LANDSCAPE/FOLIATE	BLUE
68	CUP	WHITEWARE	TRANSFER	B	GEOMETRIC/FOLIATE	BLUE
69	CUP	WHITEWARE	TRANSFER	B	FOLIATE	BLUE
70	HOLLOW	WHITEWARE	TRANSFER	B	FLORAL	BLUE
72	HOLLOW	WHITEWARE	TRANSFER	E	GEOMETRIC/FLORAL	BLUE
73	PLATE	WHITEWARE	TRANSFER	B	GEOMETRIC	BLUE

TABLE 66 (Continued).

VESSEL NUMBER	FORM	WARE	DECORATION	CLASS	MOTIF	COLOR
74	HOLLOW	WHITEWARE	TRANSFER	B	GEOMETRIC/FLORAL	BLUE
77	PLATE	WHITEWARE	TRANSFER	B	FLORAL	BLUE
78	PLATE	WHITEWARE	TRANSFER	C	LANDSCAPE/MYTHICAL	BLUE
79	FLAT	WHITEWARE	TRANSFER	C	LANDSCAPE	BLUE
81	BOWL	WHITEWARE	TRANSFER	B	LANDSCAPE/FLORAL	BLUE
82	FLAT	WHITEWARE	TRANSFER	B	FLORAL	BLUE
83	PLATE	WHITEWARE	TRANSFER	B	FLORAL/GEOMETRIC	BLUE
84	HOLLOW	WHITEWARE	TRANSFER	E	LANDSCAPE/GEOMETRIC	BLACK
85	CREAMER	WHITEWARE	TRANSFER	B	FLORAL	BLACK
86	FLAT	WHITEWARE	TRANSFER	D	FLORAL	RED
88	PLATE	WHITEWARE	TRANSFER	B	FLORAL	RED
89	FLAT	WHITEWARE	TRANSFER	B	FLORAL	BLUE
90	PLATE	WHITEWARE	TRANSFER	D	WILLOW	BLUE
91	FLAT	WHITEWARE	TRANSFER	D	WILLOW	BLUE
92	HOLLOW	WHITEWARE	TRANSFER	B	GEOMETRIC	BLUE
93	FLAT	WHITEWARE	TRANSFER	B	GEOMETRIC	BLUE
94	FLAT	WHITEWARE	TRANSFER	B	GEOMETRIC	BLUE
95	HOLLOW	WHITEWARE	TRANSFER	C	GEOMETRIC/LANDSCAPE	BLUE
97	PLATE	WHITEWARE	TRANSFER	D	FLORAL/GEOMETRIC	PURPLE
98	HOLLOW	WHITEWARE	TRANSFER	B	GEOMETRIC	PURPLE
99	PLATE	WHITEWARE	TRANSFER	B	GEOMETRIC	PURPLE
101	HOLLOW	WHITEWARE	TRANSFER	B	WILLOW	BLUE
103	?	WHITEWARE	TRANSFER	B	GEOMETRIC	BLUE
104	FLAT	WHITEWARE	TRANSFER	B	FLORAL/GEOMETRIC	BLUE
105	?	WHITEWARE	TRANSFER	B	FOLIATE	BLUE
106	PLATE	WHITEWARE	TRANSFER	D	LANDSCAPE/GEOMETRIC	BLUE
107	FLAT	WHITEWARE	TRANSFER	B	GEOMETRIC	BLUE
108	TEAP.LID	WHITEWARE	TRANSFER	B	FOLIATE	BLUE
109	FLAT	WHITEWARE	TRANSFER	B	FLORAL	BLUE
112	FLAT	WHITEWARE	TRANSFER	E	GEOMETRIC	BLUE
113	HOLLOW	WHITEWARE	TRANSFER	B	FLORAL/GEOMETRIC	RED
116	PLATE	WHITEWARE	TRANSFER	C	LANDSCAPE	BLACK
117	CUP	WHITEWARE	TRANSFER	B	FLORAL/ZOOMORPHIC	PINK
118	FLAT	WHITEWARE	TRANSFER	E	FLORAL	RED
119	FLAT	WHITEWARE	TRANSFER	C	GEOMETRIC/LANDSCAPE	BROWN
120	HOLLOW	WHITEWARE	TRANSFER	E	GEOMETRIC	BROWN
121	BOWL	WHITEWARE	TRANSFER	C	GEOMETRIC/LANDSCAPE	BROWN
123	PLATE	WHITEWARE	TRANSFER	B	FLORAL/LANDSCAPE	BROWN
124	HOLLOW	WHITEWARE	TRANSFER	B	SCRIPT	BROWN
126	?	WHITEWARE	TRANSFER	B	GEOMETRIC/FLORAL	BROWN
127	?	WHITEWARE	TRANSFER	E	FLORAL	BROWN
129	PLATE	WHITEWARE	TRANSFER	C	LANDSCAPE	BROWN
130	PLATE	WHITEWARE	TRANSFER	C	LANDSCAPE	BROWN
131	PLATE	WHITEWARE	TRANSFER	B	GEOMETRIC/FLORAL	BLUE
134	?	WHITEWARE	TRANSFER	B	FOLIATE	PURPLE
136	CUP	WHITEWARE	TRANSFER	B	GEOMETRIC	BLUE
137	BOAT	WHITEWARE	TRANSFER	B	LANDSCAPE	BLUE
138	FLAT	WHITEWARE	TRANSFER	B	GEOMETRIC/FLORAL	BLACK

TABLE 66 (Continued).

VESSEL NUMBER	FORM	WARE	DECORATION	CLASS	MOTIF	COLOR
140	PLATE	WHITEWARE	TRANSFER	C	FLORAL	BLACK
141	SAUCER	WHITEWARE	TRANSFER	C	FLORAL	BLACK
142	LID	WHITEWARE	TRANSFER	B	FOLIATE	BLUE
143	BOWL	WHITEWARE	TRANSFER	B	FOLIATE	PURPLE
144	BOWL	WHITEWARE	TRANSFER	B	?	PURPLE
147	BOWL	WHITEWARE	DIPPED	B	ANNULAR	BLUE
149	BOWL	WHITEWARE	DIPPED	C	ANNULAR	BLUE,GREEN
151	BOWL	WHITEWARE	DIPPED	B	ANNULAR	BLUE
152	BOWL	WHITEWARE	DIPPED	B	ANNULAR	BLUE
155	BOWL	WHITEWARE	DIPPED	B	ANNULAR	BROWN,BLUE
156	HOLLOW	WHITEWARE	DIPPED	B	ANNULAR	BLUE
157	HOLLOW	WHITEWARE	DIPPED	B	ANNULAR	BLUE
159	BOWL	WHITEWARE	DIPPED	B	ANNULAR	BLUE,GREEN
161	HOLLOW	WHITEWARE	DIPPED	E	ANNULAR	GREEN,BROWN
162	HOLLOW	WHITEWARE	DIPPED	B	ANNULAR	BROWN,YELLOW,GREEN
163	BOWL	WHITEWARE	DIPPED	B	ANNULAR	BROWN,BLUE
164	BOWL	WHITEWARE	DIPPED	B	ANNULAR	BLUE
165	HOLLOW	WHITEWARE	DIPPED	B	ANNULAR	BLUE
166	BOWL	WHITEWARE	DIPPED	B	ANNULAR	BLUE,GREEN
167	HOLLOW	WHITEWARE	DIPPED	B	FINGERPAINTED	BLUE,GREEN
168	HOLLOW	WHITEWARE	DIPPED	E	ANNULAR	BLACK,PURPLE
169	HOLLOW	WHITEWARE	DIPPED		ANNULAR	BLUE
170	HOLLOW	WHITEWARE	DIPPED	B	ANNULAR	BLUE,GREEN
171	?	WHITEWARE	DIPPED	E	ANNULAR	GREEN
172	HOLLOW	WHITEWARE	DIPPED	B	ANNULAR	BLUE
173	BOWL	WHITEWARE	DIPPED	B	ANNULAR	BLUE
174	HOLLOW	WHITEWARE	DIPPED	B	ANNULAR	BROWN,BLUE
177	HOLLOW	WHITEWARE	DIPPED	B	ANNULAR	GREEN,YELLOW
179	HOLLOW	WHITEWARE	DIPPED	E	BANDED	GREEN,BROWN
180	HOLLOW	WHITEWARE	DIPPED	B	ANNULAR,FINGER PAINTED	GREEN,BROWN
181	?	WHITEWARE	DIPPED	E	ANNULAR	BLUE,RED
183	?	WHITEWARE	DIPPED	B	ANNULAR	GREEN
184	HOLLOW	WHITEWARE	DIPPED	E	ANNULAR,MOCHA	GREEN,GREY,BROWN
185	HOLLOW	WHITEWARE	DIPPED	E	ANNULAR	GREEN,BROWN
186	HOLLOW	WHITEWARE	DIPPED	E	ANNULAR	GREEN
187	BOWL	WHITEWARE	DIPPED	B	ANNULAR	BLUE
188	HOLLOW	WHITEWARE	DIPPED	B	ANNULAR	BLUE
189	HOLLOW	WHITEWARE	DIPPED	B	ANNULAR	BLUE
190	HOLLOW	WHITEWARE	DIPPED	B	ANNULAR	GREEN,BLUE
191	BOWL	WHITEWARE	DIPPED	C	ANNULAR	BROWN,BLUE
192	HOLLOW	WHITEWARE	DIPPED	B	ANNULAR	YELLOW,BROWN,BLUE
195	HOLLOW	WHITEWARE	DIPPED	B	ANNULAR	BLUE
196	HOLLOW	WHITEWARE	DIPPED	E	ANNULAR	BROWN,GREEN,BLUE
197	HOLLOW	WHITEWARE	DIPPED	B	ANNULAR	BLUE
198	HOLLOW	WHITEWARE	DIPPED	E	ANNULAR	BLUE
201	HOLLOW	WHITEWARE	DIPPED	E	ANNULAR	BROWN,YELLOW
202	HOLLOW	WHITEWARE	DIPPED	E	ANNULAR	BLUE,BROWN
205	HOLLOW	WHITEWARE	TRANSFER		GEOMETRIC/LANDSCAPE	PURPLE

TABLE 66 (Continued).

VESSEL NUMBER	FORM	WARE	DECORATION	CLASS	MOTIF	COLOR
207	HOLLOW	WHITEWARE	DIPPED	E	ANNULAR,MOCHA	TAN,BLACK
209	BOWL	WHITEWARE	PAINTED	B	FLORAL	GREEN,BLACK,PINK
213	SAUCER	WHITEWARE	PAINTED	D	FLORAL	BLUE,YELLOW,GREEN
214	PLATE	WHITEWARE	PAINTED	B	FLORAL	BLUE,YELLOW,GREEN
218	BOWL	WHITEWARE	TRANSFER	A	SCRIPT	BLACK
219	SAUCER	WHITEWARE	TRANSFER	C	STILL LIFE	PURPLE
222	FLAT	WHITEWARE	PAINTED	B	FLORAL	BLACK
223	PLATE	WHITEWARE	PAINTED	B	BANDED	BLACK
224	FLAT	WHITEWARE	PAINTED	B	BANDED	BLACK
225	FLAT	WHITEWARE	PAINTED	B	BANDED	GREEN
227	FLAT	WHITEWARE	PAINTED	B	FLORAL	RED,YELLOW,GREEN
228	HOLLOW	WHITEWARE	PAINTED	B	FLORAL	RED,YELLOW,GREEN
234	BOWL	WHITEWARE	PAINTED	B	FLORAL	BLUE,BLACK,RED
236	BOWL	WHITEWARE	PAINTED	C	FLORAL	GREEN,BLACK,RED
239	FLAT	WHITEWARE	PAINTED	B	FOLIATE	RED,GREEN
240	CUP	WHITEWARE	PAINTED	B	FOLIATE	RED,GREEN
243	HOLLOW	WHITEWARE	PAINTED	B	FLORAL	BLUE,GREEN,BLACK
244	FLAT	WHITEWARE	TRANSFER	C	LANDSCAPE	BLUE
245	HOLLOW	WHITEWARE	PAINTED	B	FLORAL	RED,GREEN,BLACK
246	PLATE	WHITEWARE	PAINTED	C	FOLIATE	BLUE
247	FLAT	WHITEWARE	PAINTED	E	FOLIATE	GREEN,BLUE,BLACK
249	FLAT	WHITEWARE	PAINTED	E	FLORAL	GREEN,RED,BLUE,BLACK
250	FLAT	WHITEWARE	PAINTED	B	FLORAL	GREEN,RED,BLACK
251	HOLLOW	WHITEWARE	PAINTED	B	FLORAL	BLUE,YELLOW
253	HOLLOW	WHITEWARE	PAINTED	E	FLORAL	RED,GREEN
254	?	WHITEWARE	PAINTED	E	FLORAL	YELLOW
256	HOLLOW	WHITEWARE	PAINTED	D	SCRIPT	GREEN
257	FLAT	WHITEWARE	PAINTED	B	FLORAL	BLUE,GREEN
258	FLAT	WHITEWARE	PAINTED	A	FLORAL	GREEN,RED,BLACK
259	BOWL	WHITEWARE	PAINTED	C	FLORAL	GREEN,RED,BLACK
261	FLAT	WHITEWARE	PAINTED	E	FLORAL	RED,GREEN,BLUE
262	PLATE	WHITEWARE	PAINTED	B	FLORAL	PINK,BLACK,GREEN,BLUE
263	CUP	WHITEWARE	PAINTED	B	FOLIATE	BLUE,BLACK
265	HOLLOW	WHITEWARE	PAINTED	E	FOLIATE	BLUE
266	HOLLOW	WHITEWARE	PAINTED	B	FOLIATE	GREEN,BLACK
279	FLAT	WHITEWARE	PAINTED	E	FLORAL	PINK
280	PLATE	WHITEWARE	PAINTED	D	FOLIATE	PINK,GREEN,BLACK
281	HOLLOW	WHITEWARE	PAINTED	E	FOLIATE	BLUE
283	HOLLOW	WHITEWARE	PAINTED	E	FOLIATE	RED,BLACK
284	BOWL	WHITEWARE	PAINTED	E	FLORAL	BLUE,GREEN,YELLOW
287	FLAT	WHITEWARE	PAINTED	C	FLORAL	BLUE
288	HOLLOW	WHITEWARE	PAINTED	B	FLORAL	GREEN,BLACK,RED
290	SAUCER	WHITEWARE	PAINTED	D	FLORAL	BLUE,GREEN
292	HOLLOW	WHITEWARE	SPONGED	E		YELLOW,PINK,GREEN
293	HOLLOW	WHITEWARE	SPONGED	B		PURPLE,RED
295	FLAT	WHITEWARE	SPONGED	B		PURPLE
296	HOLLOW	WHITEWARE	PAINTED	E		BLUE
297	FLAT	WHITEWARE	SPONGED	B		BLUE
298	FLAT	WHITEWARE	SPONGED	E		GREEN,RED,PURPLE

TABLE 66 (Continued).

VESSEL NUMBER	FORM	WARE	DECORATION	CLASS	MOTIF	COLOR
299	HOLLOW	WHITEWARE	DIPPED	E	ANNULAR	BLUE,YELLOW,BROWN,GREEN
300	HOLLOW	WHITEWARE	DIPPED		BANDED	BLUE
302	FLAT	WHITEWARE	SPONGED	B		RED
303	HOLLOW	WHITEWARE	SPONGED	C		GREEN,BLUE
304	FLAT	WHITEWARE	SPONGED	B		GREEN,RED
307	HOLLOW	WHITEWARE	SPONGED	B		GREEN
308	FLAT	WHITEWARE	PAINTED	B	FLORAL	RED
311	BOWL	WHITEWARE	PAINTED	C	FLORAL	BLUE
314	BOWL	WHITEWARE	PAINTED	C	FOLIATE	GREEN
315	FLAT	WHITEWARE	PAINTED	B	FLORAL	RED,GREEN
316	CUP	WHITEWARE	PAINTED	B	FLORAL	BLUE,BLACK,GREEN
317	HOLLOW	WHITEWARE	PAINTED	B	BANDED	BROWN
319	?	WHITEWARE	PAINTED	B	BANDED	BLACK,BLUE
320	?	WHITEWARE	PAINTED	B	BANDED	BLACK
321	?	WHITEWARE	PAINTED	B	BANDED	BROWN
322	HOLLOW	WHITEWARE	PAINTED	B	BANDED	BROWN
323	?	WHITEWARE	PAINTED	B	BANDED	BLACK
324	?	WHITEWARE	PAINTED	B	BANDED	RED,BLACK
325	HOLLOW	WHITEWARE	PAINTED	B	BANDED	BLACK
326	?	WHITEWARE	PAINTED	B	BANDED	BLUE
327	FLAT	WHITEWARE	PAINTED	B	BANDED	RED
328	?	WHITEWARE	PAINTED	B	BANDED	BLACK
330	?	WHITEWARE	PAINTED	B	BANDED	BLACK
331	?	WHITEWARE	PAINTED	B	BANDED	BLACK
332	HOLLOW	WHITEWARE	PAINTED	B	BANDED	BLACK
333	?	WHITEWARE	PAINTED	B	BANDED	BLACK
334	FLAT	WHITEWARE	SPONGED	B		BLUE,RED
337	HOLLOW	WHITEWARE	PAINTED	E	FLORAL	GREEN,BLUE,RED
340	HOLLOW	WHITEWARE	PAINTED	E	FLORAL	RED,GREEN
342	HOLLOW	WHITEWARE	PAINTED	E	FLORAL	GREEN,RED
343	PLATE	WHITEWARE	PAINTED	E	FLORAL	BLUE,GREEN,RED
345	PLATE	WHITEWARE	PAINTED	B	BANDED	BLUE,GREEN
346	HOLLOW	WHITEWARE	PAINTED	B	FOLIATE	RED,BLUE
347	PLATE	WHITEWARE	PAINTED	C	FLORAL	RED,GREEN
349	FLAT	WHITEWARE	PAINTED	B	FOLIATE	BLUE
350	BOWL	WHITEWARE	PAINTED	D	FOLIATE	BLUE
352	FLAT	WHITEWARE	PAINTED	B	BANDED	BLUE
356	FLAT	WHITEWARE	PAINTED	C	FOLIATE	BLUE
357	HOLLOW	WHITEWARE	PAINTED	B	BANDED	BLUE,BLACK
359	FLAT	WHITEWARE	PAINTED	E	FLORAL	BLUE
360	HOLLOW	WHITEWARE	PAINTED	E	FLORAL	BLUE
362	HOLLOW	WHITEWARE	PAINTED	B	FOLIATE	BLUE,GREEN
363	FLAT	WHITEWARE	PAINTED	B	GEOMETRIC	BLUE
364	FLAT	WHITEWARE	PAINTED	B	BANDED	BLUE
366	HOLLOW	WHITEWARE	PAINTED	B	BANDED	BLUE
368	PLATE	WHITEWARE	PAINTED	B	FLORAL	BLUE
369	HOLLOW	WHITEWARE	PAINTED	B	BANDED	BLUE
370	HOLLOW	WHITEWARE	PAINTED	B	FLORAL	BLUE

TABLE 66 (Continued).

VESSEL NUMBER	FORM	WARE	DECORATION	CLASS	MOTIF	COLOR
371	HOLLOW	WHITEWARE	PAINTED	B	BANDED	BLUE
372	HOLLOW	WHITEWARE	PAINTED	B	SPONGED	RED
374	FLAT	WHITEWARE	PAINTED	B	BANDED	BLUE
375	FLAT	WHITEWARE	PAINTED	B	FLORAL	BLUE
376	PLATE	WHITEWARE	EDGED	B	REGULAR SCALLOPED,BUD	GREEN
379	PLATE	WHITEWARE	EDGED	B	REGULAR SCALLOPED,BUD	GREEN
380	PLATE	WHITEWARE	EDGED	B	REGULAR SCALLOPED,BUD	GREEN
381	PLATE	WHITEWARE	EDGED	B	REGULAR SCALLOPED,FEATHER	GREEN
382	PLATE	WHITEWARE	EDGED	B	REGULAR SCALLOPED,BUD	GREEN
383	PLATE	WHITEWARE	EDGED	B	REGULAR SCALLOPED,BUD	GREEN
385	PLATE	WHITEWARE	EDGED	B	REGULAR SCALLOPED,BUD	BLUE
387	PLATE	WHITEWARE	EDGED	B	REGULAR SCALLOPED,BUD	BLUE
389	PLATE	WHITEWARE	EDGED	B	REGULAR SCALLOPED,BUD	BLUE
391	PLATE	WHITEWARE	EDGED	B	REGULAR SCALLOPED,BUD	BLUE
393	PLATE	WHITEWARE	EDGED	B		BLUE
394	PLATE	WHITEWARE	EDGED	B	SCALLOPED	BLUE
396	PLATE	WHITEWARE	EDGED	B	UNSCALLOPED	BLUE
398	PLATE	WHITEWARE	EDGED	B	REGULAR SCALLOPED,BUD	BLUE
405	PLATE	WHITEWARE	EDGED	B	IRREGULAR SCALLOPED	BLUE
406	PLATE	WHITEWARE	EDGED	B	IRREGULAR SCALLOPED,BUD	BLUE
407	PLATE	WHITEWARE	EDGED	B	UNSCALLOPED	BLUE
408	PLATE	WHITEWARE	EDGED	B	REGULAR SCALLOPED	BLUE
411	PLATE	WHITEWARE	EDGED	B	UNSCALLOPED	BLUE
412	PLATE	WHITEWARE	EDGED	B	IRREGULAR SCALLOPED,BUD	BLUE
413	PLATE	WHITEWARE	EDGED	B		BLUE
414	PLATE	WHITEWARE	EDGED	B	IRREGULAR SCALLOPED,BUD	BLUE
415	PLATE	WHITEWARE	EDGED	B	IRREGULAR SCALLOPED,BUD	BLUE
416	PLATE	WHITEWARE	EDGED	B	UNSCALLOPED	BLUE
417	PLATE	WHITEWARE	EDGED	B	REGULAR SCALLOPED,BUD	BLUE
419	PLATE	WHITEWARE	EDGED	B	REGULAR SCALLOPED,BUD	BLUE
420	PLATTER	WHITEWARE	EDGED	B	UNSCALLOPED	BLUE
421	PLATE	WHITEWARE	EDGED	B	IRREGULAR SCALLOPED,BUD	BLUE
422	PLATE	WHITEWARE	EDGED	B	REGULAR SCALLOPED,BUD	BLUE
423	PLATE	WHITEWARE	EDGED	B	REGULAR SCALLOPED,BUD	BLUE
424	PLATE	WHITEWARE	EDGED	B	UNSCALLOPED,FLORAL	BLUE
425	PLATE	WHITEWARE	EDGED	B	SCALLOPED,FLORAL AND REEL	BLUE
426	PLATE	WHITEWARE	EDGED	B	UNSCALLOPED	BLUE
427	PLATE	WHITEWARE	EDGED	B	IRREGULAR SCALLOPED,BUD	BLUE
429	PLATE	WHITEWARE	EDGED	B	FLORAL	BLUE
430	PLATE	WHITEWARE	EDGED	B	IRREGULAR SCALLOPED,BUD	BLUE
431	PLATE	WHITEWARE	EDGED	B	REGULAR SCALLOPED,BUD	BLUE
433	PLATE	WHITEWARE	EDGED	B	REGULAR SCALLOPED,BUD	BLUE
434	PLATE	WHITEWARE	EDGED	B	REGULAR SCALLOPED,BUD	BLUE
436	PLATE	WHITEWARE	EDGED	B	REGULAR SCALLOPED,BUD	BLUE
437	PLATE	WHITEWARE	EDGED	B	REGULAR SCALLOPED,BUD	BLUE
438	PLATE	WHITEWARE	EDGED	B	REGULAR SCALLOPED,BUD	BLUE
439	PLATE	WHITEWARE	EDGED	B	BEADED	BLUE
440	PLATE	WHITEWARE	EDGED	B	FLORAL	BLUE

TABLE 66 (Continued).

VESSEL NUMBER	FORM	WARE	DECORATION	CLASS	MOTIF	COLOR
442	PLATE	WHITEWARE	EDGED	B	REGULAR SCALLOPED,BUD	BLUE
445	PLATE	WHITEWARE	EDGED	B	REGULAR SCALLOPED,BUD	BLUE
446	PLATE	WHITEWARE	EDGED	B	REGULAR SCALLOPED,BUD	BLUE
447	SAUCER	WHITEWARE	EDGED	B	IRREGULAR SCALLOPED,BUD	BLUE
448	PLATE	WHITEWARE	EDGED	B	IRREGULAR SCALLOPED,BUD	BLUE
449	PLATE	WHITEWARE	EDGED	B	IRREGULAR SCALLOPED,BUD	BLUE
450	PLATE	WHITEWARE	EDGED	B	IRREGULAR SCALLOPED,BUD	BLUE
452	PLATE	WHITEWARE	EDGED	B	FLORAL	BLUE
453	PLATE	WHITEWARE	EDGED	B		BLUE
455	PLATE	WHITEWARE	EDGED	B	IRREGULAR SCALLOPED,BUD	BLUE
458	PLATE	WHITEWARE	EDGED	B	REGULAR SCALLOPED,BUD	BLUE
459	PLATTER	WHITEWARE	EDGED	B	UNSCALLOPED	BLUE
461	PLATE	WHITEWARE	EDGED	B	REGULAR SCALLOPED	BLUE
463	PLATTER	WHITEWARE	EDGED	B	RAISED DOTS	BLUE
464	PLATE	WHITEWARE	EDGED	B	FLORAL AND FESTOONED	BLUE
466	PLATE	WHITEWARE	EDGED	B	UNSCALLOPED	BLUE
467	PLATE	WHITEWARE	EDGED	B	UNSCALLOPED	BLUE
468	PLATE	WHITEWARE	EDGED	B	UNSCALLOPED	BLUE
469	PLATE	WHITEWARE	EDGED	B	REGULAR SCALLOPED	BLUE
470	PLATE	WHITEWARE	EDGED	B	UNSCALLOPED	BLUE
471	PLATE	WHITEWARE	EDGED	B	UNSCALLOPED	BLUE
472	PLATE	WHITEWARE	EDGED	B	UNSCALLOPED,FLORAL	BLUE
473	PLATE	WHITEWARE	EDGED	B	REGULAR SCALLOPED	BLUE
474	PLATE	WHITEWARE	EDGED	B	REGULAR SCALLOPED	BLUE
475	?	WHITEWARE	EDGED	B		BLUE
477	PLATE	WHITEWARE	EDGED	B	UNSCALLOPED	BLUE
478	PLATE	WHITEWARE	EDGED	B	UNSCALLOPED	BLUE
479	PLATE	WHITEWARE	EDGED	B	UNSCALLOPED	BLUE
480	PLATE	WHITEWARE	EDGED	B	UNSCALLOPED	BLUE
481	PLATE	WHITEWARE	EDGED	B	UNSCALLOPED	BLUE
482	PLATE	WHITEWARE	EDGED	B	UNSCALLOPED	BLUE
484	PLATE	WHITEWARE	EDGED	B	REGULAR SCALLOPED	BLUE
485	PLATE	WHITEWARE	EDGED	B	UNSCALLOPED	BLUE
488	PLATE	WHITEWARE	EDGED	B	REGULAR SCALLOPED	BLUE
489	PLATE	WHITEWARE	EDGED	B	REGULAR SCALLOPED	BLUE
490	PLATE	WHITEWARE	EDGED	B	REGULAR SCALLOPED	BLUE
492	PLATE	WHITEWARE	EDGED	B	UNSCALLOPED	BLUE
493	PLATE	WHITEWARE	EDGED	B	REGULAR SCALLOPED	BLUE
495	PLATE	WHITEWARE	EDGED	B	UNSCALLOPED	BLUE
496	PLATE	WHITEWARE	EDGED	B	UNSCALLOPED	BLUE
498	PLATE	WHITEWARE	EDGED	B	IRREGULAR SCALLOPED,FLORAL	GREEN
500	PLATE	WHITEWARE	EDGED	B	IRREGULAR SCALLOPED,FLORAL	GREEN
501	PLATE	WHITEWARE	EDGED	B	IRREGULAR SCALLOPED	GREEN
502	PLATE	WHITEWARE	PLAIN	B		
503	HOLLOW	WHITEWARE	PLAIN	B		
504	HOLLOW	WHITEWARE	PLAIN	B		
505	HOLLOW	WHITEWARE	PLAIN	B		
506	PLATE	WHITEWARE	PLAIN	B		

TABLE 66 (Continued).

VESSEL NUMBER	FORM	WARE	DECORATION	CLASS	MOTIF	COLOR
561	BOWL	WHITEWARE	PLAIN	B		
562	CUP	WHITEWARE	PLAIN	B		
563	HOLLOW	WHITEWARE	PLAIN	B	MOLDED	
564	FLAT	WHITEWARE	PLAIN	B		BLUE TINT
565	HOLLOW	WHITEWARE	PLAIN	B		
566	HOLLOW	WHITEWARE	PLAIN	B		BLUE TINT
567	HOLLOW	WHITEWARE	PLAIN	B		
568	HOLLOW	WHITEWARE	PLAIN	B		
569	HOLLOW	WHITEWARE	PLAIN	B		
570	HOLLOW	WHITEWARE	PLAIN	B		BLUE TINT
571	CUP	WHITEWARE	PLAIN	B	MOLDED	
572	CUP	WHITEWARE	PLAIN	B	PANNELED	BLUE TINT
573	HOLLOW	WHITEWARE	PLAIN	B		
574	SAUCER	WHITEWARE	PLAIN	B		
575	HOLLOW	WHITEWARE	PLAIN	B		
576	HOLLOW	WHITEWARE	PLAIN	B		BLUE TINT
577	HOLLOW	WHITEWARE	PLAIN	B		
578	CUP	WHITEWARE	PLAIN	B	MOLDED	
579	HOLLOW	WHITEWARE	PLAIN	B		BLUE TINT
580	HOLLOW	WHITEWARE	PLAIN	B		
581	HOLLOW	WHITEWARE	PLAIN	B		
582	HOLLOW	WHITEWARE	PLAIN	B	MOLDED	
584	HOLLOW	WHITEWARE	PLAIN	B	MOLDED	
585	HOLLOW	WHITEWARE	PLAIN	B		BLUE TINT
586	HOLLOW	WHITEWARE	PLAIN	B		BLUE TINT
587	HOLLOW	WHITEWARE	PLAIN	B		
589	FLAT	WHITEWARE	PLAIN	B		
590	HOLLOW	WHITEWARE	PLAIN	B	MOLDED	
591	HOLLOW	WHITEWARE	PLAIN	B		BLUE TINT
592	HOLLOW	WHITEWARE	PLAIN	B		
593	BOWL	WHITEWARE	PLAIN	B	MOLDED	
594	HOLLOW	WHITEWARE	PLAIN	B		
595	HOLLOW	WHITEWARE	PLAIN	B		
596	HOLLOW	WHITEWARE	PLAIN	B		BLUE TINT
598	HOLLOW	WHITEWARE	PLAIN	B	MOLDED	
599	FLAT	WHITEWARE	PLAIN	B		CREAMY
600	CHAMBER	WHITEWARE	PLAIN	B		
601	HOLLOW	WHITEWARE	PLAIN	B		
602	CHAMBER	WHITEWARE	PLAIN	B		
603	HOLLOW	WHITEWARE	PLAIN	B		BLUE TINT
604	HOLLOW	WHITEWARE	PLAIN	B		
605	CHAMBER	WHITEWARE	PLAIN	B		
607	HOLLOW	WHITEWARE	PLAIN	B	PANNELED	BLUE TINT
608	HOLLOW	WHITEWARE	PLAIN	B		
609	HOLLOW	WHITEWARE	PLAIN	B		BLUE TINT
610	HOLLOW	WHITEWARE	PLAIN	B		BLUE TINT
611	HOLLOW	WHITEWARE	PLAIN	B		BLUE TINT
612	HOLLOW	WHITEWARE	PLAIN	B		BLUE TINT

TABLE 66 (Continued).

VESSEL NUMBER	FORM	WARE	DECORATION	CLASS	MOTIF	COLOR
613	FLAT	WHITEWARE	PLAIN	B		
614	HOLLOW	WHITEWARE	PLAIN	B		GREY TINT
615	FLAT	WHITEWARE	PLAIN	B		
616	PLATE	WHITEWARE	PLAIN	B	MOLDED	CREAMY
617	PLATE	WHITEWARE	PLAIN	B		
618	PLATE	WHITEWARE	PLAIN	B		
619	BOWL	WHITEWARE	PLAIN	B		
620	FLAT	WHITEWARE	PLAIN	B		
621	PLATE	WHITEWARE	PLAIN	B		
623	PLATE	WHITEWARE	PLAIN	B		BLUE TINT
625	PLATE	WHITEWARE	PLAIN	B		
626	SAUCER	WHITEWARE	PLAIN	B		
627	PLATE	WHITEWARE	PLAIN	B		
628	PLATE	WHITEWARE	PLAIN	B		
629	PLATE	WHITEWARE	PLAIN	B	MOLDED	BLUE TINT
630	PLATE	WHITEWARE	PLAIN	B	MOLDED/FOLIATE	
631	PLATE	WHITEWARE	PLAIN	B		
632	PLATE	WHITEWARE	PLAIN	E	MOLDED/FLORAL	
633	PLATE	WHITEWARE	PLAIN	B		
634	PLATE	WHITEWARE	PLAIN	B		
635	BOWL	WHITEWARE	PLAIN	B		
636	HOLLOW	WHITEWARE	PLAIN	B		
637	PLATE	WHITEWARE	PLAIN	B	EMBOSSED/FLORAL	
638	PLATE	WHITEWARE	PLAIN	B	EMBOSSED/ALPHABET	
639	BOWL	WHITEWARE	PLAIN	B		
641	PLATE	WHITEWARE	PLAIN	B		
642	?	WHITEWARE	PLAIN	B		
643	BOWL	WHITEWARE	PLAIN	B		
645	PLATE	WHITEWARE	PLAIN	B		
646	BOWL	WHITEWARE	PLAIN	B		
649	BOWL	WHITEWARE	PLAIN	B		
650	PLATE	WHITEWARE	PLAIN	B		
652	PLATE	WHITEWARE	PLAIN	B		
653	PLATE	WHITEWARE	PLAIN	B		
655	PLATE	IRONSTONE	EMBOSSED	A		
656	CUP	IRONSTONE	EMBOSSED	B	PANNELED	
657	CUP	IRONSTONE	EMBOSSED	B	MOLDED	
658	CUP	IRONSTONE		B		
659	CUP	IRONSTONE		B		
660	CUP	IRONSTONE	EMBOSSED	B	PANNELED	
662	PLATE	IRONSTONE		B		
663	CUP	IRONSTONE		B		
664	PLATE	IRONSTONE		D		BLUE TINT
666	SAUCER	IRONSTONE		B		
667	PLATE	IRONSTONE		B		
668	SAUCER	IRONSTONE		B		
669	SAUCER	IRONSTONE		B		
670	SAUCER	IRONSTONE		B		

TABLE 66 (Continued).

VESSEL NUMBER	FORM	WARE	DECORATION	CLASS	MOTIF	COLOR
671	SAUCER	IRONSTONE		B		
672	CUP	IRONSTONE	EMBOSSED	B	PANNELED	BLUE TINT
673	CUP	IRONSTONE		B		
674	CUP	IRONSTONE		B		
675	FLAT	IRONSTONE		B		
676	SAUCER	IRONSTONE		B		
677	CUP	IRONSTONE		B		
678	SAUCER	IRONSTONE		B		
679	PLATE	IRONSTONE		B		
680	CUP	IRONSTONE	EMBOSSED.	B	PANNELED	
681	PLATE	IRONSTONE	EMBOSSED	A	MOLDED	

TABLE 67. **Ceramic vessel analysis - creek deposit.**

VESSEL NUMBER	FORM	WARE	DECORATION	CLASS	MOTIF	COLOR
1	PLATE	WHITEWARE	TRANSFER	A	LANDSCAPE	GREEN
2	BOWL	WHITEWARE	TRANSFER	A	FLORAL	BLUE
5	SAUCER	WHITEWARE	TRANSFER	A	LANDSCAPE/FLORAL	GREEN
6	CUP	WHITEWARE	TRANSFER	B	FLORAL	BLUE
10	HOLLOW	WHITEWARE	TRANSFER	B	FLORAL	BLUE
11	BOWL	WHITEWARE	TRANSFER	B	FLORAL	BLUE
15	HOLLOW	WHITEWARE	TRANSFER	B	FLORAL/LANDSCAPE	BLUE
17	CUP	WHITEWARE	TRANSFER	C	LANDSCAPE	GREEN
20	FLAT	WHITEWARE	TRANSFER	B	GEOMETRIC	GREEN
23	FLAT	WHITEWARE	TRANSFER	D	FLORAL	BLUE
24	SPLATE	WHITEWARE	TRANSFER	D	FLORAL	BLUE
26	HOLLOW	WHITEWARE	TRANSFER	B	FOLIATE/GEOMETRIC	BLUE
27	FLAT	WHITEWARE	TRANSFER	C	LANDSCAPE	GREEN
28	HOLLOW	WHITEWARE	TRANSFER	B	FLORAL/LANDSCAPE	BLUE
29	CUP	WHITEWARE	TRANSFER	B	GEOMETRIC	BLUE
31	PLATE	WHITEWARE	TRANSFER	D	FLORAL	BLUE
37	HOLLOW	WHITEWARE	TRANSFER	D	FLORAL	BLUE
53	HOLLOW	WHITEWARE	TRANSFER	E	FLORAL	BLUE
54	PLATE	WHITEWARE	TRANSFER	B	GEOMETRIC	BLUE
57	FLAT	WHITEWARE	TRANSFER	B	FLORAL	BLUE
58	PLATTER	WHITEWARE	TRANSFER	B	FLORAL/GEOMETRIC	BLUE
59	PLATE	WHITEWARE	TRANSFER	B	FLORAL	BLUE
63	HOLLOW	WHITEWARE	TRANSFER	E	LANDSCAPE/CHINSOIRE	BLUE
66	PLATE	WHITEWARE	TRANSFER	B	FLORAL	BLUE
71	HOLLOW	WHITEWARE	TRANSFER	E	FLORAL/LANDSCAPE	BLUE
75	FLAT	WHITEWARE	TRANSFER	D	FOLIATE	BLUE
76	PLATE	WHITEWARE	TRANSFER	B	FLORAL/LANDSCAPE	BLACK
80	CUP	WHITEWARE	TRANSFER	C	LANDSCAPE	BLUE
87	PLATE	WHITEWARE	TRANSFER	B	FLORAL	BLUE
96	FLAT	WHITEWARE	TRANSFER	E	FLORAL/GEOMETRIC	BLUE
100	BOWL	WHITEWARE	TRANSFER	B	FLORAL	BLUE
102	FLAT	WHITEWARE	TRANSFER	D	FOLIATE	BLUE
110	CHAMBER	WHITEWARE	TRANSFER	B	FLORAL/LANDSCAPE	BLUE
111	HOLLOW	WHITEWARE	TRANSFER	E	LANDSCAPE	BLUE
114	FLAT	WHITEWARE	TRANSFER	C	LANDSCAPE	BLUE
115	PLATE	WHITEWARE	TRANSFER	B	FLORAL	BLACK
122	HOLLOW	WHITEWARE	TRANSFER	C	GEOMETRIC/LANDSCAPE	BROWN
125	TEAP.LID	WHITEWARE	TRANSFER	B	GEOMETRIC/FLORAL	BROWN
128	?	WHITEWARE	TRANSFER	B	?	BROWN
132	HOLLOW	WHITEWARE	TRANSFER	E	FLORAL	PURPLE
133	HOLLOW	WHITEWARE	TRANSFER	E	GEOMETRIC/LANDSCAPE	RED
135	HOLLOW	WHITEWARE	TRANSFER	B	LANDSCAPE	PURPLE
139	HOLLOW	WHITEWARE	TRANSFER	B	LANDSCAPE	BLACK
145	BOWL	WHITEWARE	DIPPED	B	ANNULAR	GREEN,BROWN,YELLOW,BLACK
146	BOWL	WHITEWARE	DIPPED	B	ANNULAR	BROWN,BLUE,RUST
148	BOWL	WHITEWARE	DIPPED	B	ANNULAR	BROWN.GREEN,BLUE,TAN
150	BOWL	WHITEWARE	DIPPED	B	ANNULAR	BROWN,BLUE
153	BOWL	WHITEWARE	DIPPED	B	ANNULAR	BROWN.GREEN

TABLE 67 (Continued).

VESSEL NUMBER	FORM	WARE	DECORATION	CLASS	MOTIF	COLOR
154	BOWL	WHITEWARE	DIPPED	B	ANNULAR	BLUE,BROWN
158	CREAMER	WHITEWARE	DIPPED	B	ANNULAR	GREY,BROWN,GREEN
160	BOWL	WHITEWARE	DIPPED	B	ANNULAR	BROWN,TAN
175	HOLLOW	WHITEWARE	DIPPED	B	ANNULAR	BROWN,BLUE,YELLOW
176	FLAT	WHITEWARE	DIPPED	B	BANDED	BLUE
178	HOLLOW	WHITEWARE	DIPPED	B	ANNULAR	GREEN,BROWN,YELLOW
182	HOLLOW	WHITEWARE	DIPPED	E	ANNULAR	GREEN
193	HOLLOW	WHITEWARE	DIPPED	E	ANNULAR	BROWN
194	HOLLOW	WHITEWARE	DIPPED	B	ANNULAR	BROWN,BLUE,TAN
199	HOLLOW	WHITEWARE	DIPPED	B	ANNULAR	BROWN,BLUE,YELLOW
200	HOLLOW	WHITEWARE	DIPPED	B	ANNULAR	BLUE,GREEN
203	HOLLOW	WHITEWARE	DIPPED	E	ANNULAR	YELLOW,BLUE,BROWN
204	HOLLOW	WHITEWARE	DIPPED	E	ANNULAR	BROWN
210	BOWL	WHITEWARE	PAINTED	A	FLORAL	BLUE,YELLOW,GREEN
211	PLATE	WHITEWARE	TRANSFER	A	LANDSCAPE	BLACK
212	HOLLOW	WHITEWARE	PAINTED	B	FLORAL	BLUE,YELLOW,GREEN
216	BOWL	WHITEWARE	PAINTED	A	FLORAL,GEOMETRIC	BLUE,RED
217	BOWL	WHITEWARE	PAINTED	A	FLORAL,GEOMETRIC	BLUE,RED
220	BOWL	WHITEWARE	PAINTED	A	FLORAL	BLACK,GREEN,RED
221	BOWL	WHITEWARE	PAINTED	B	FOLIATE	BLUE
226	FLAT	WHITEWARE	PAINTED	B	FLORAL	RED,BLUE,GREEN
229	FLAT	WHITEWARE	PAINTED	B	FLORAL	BLACK,RED,GREEN
230	?	WHITEWARE	PAINTED	B	FLORAL	BLACK,RED,GREEN
231	?	WHITEWARE	PAINTED	B	FLORAL	BLACK,RED,GREEN,BLUE
232	HOLLOW	WHITEWARE	PAINTED	B	FOLIATE	RED,BLUE,GREEN
233	CUP	WHITEWARE	PAINTED	B	FLORAL	RED,BLUE,GREEN
235	PLATE	WHITEWARE	PAINTED	A	FOLIATE	GREEN,BLUE,BLACK,RED
237	FLAT	WHITEWARE	PAINTED	D	FLORAL	BLUE,RED,GREEN
238	CUP	WHITEWARE	PAINTED	B	FLORAL	BLUE,RED,GREEN
241	HOLLOW	WHITEWARE	PAINTED	D	FLORAL	RED,BLUE,GREEN
242	HOLLOW	WHITEWARE	PAINTED	B	FOLIATE	GREEN,BLACK,RED
248	PLATE	WHITEWARE	PAINTED	A	FLORAL	BLUE,YELLOW,GREEN
252	FLAT	WHITEWARE	PAINTED	B	FLORAL	GREEN,RED,BLACK
255	CUP	WHITEWARE	PAINTED	B	FLORAL	RED,GREEN,BLACK
260	CUP	WHITEWARE	PAINTED	B	FLORAL	BLUE,RED
264	SAUCER	WHITEWARE	PAINTED	E	FOLIATE	BLUE,BLACK,GREEN
277	HOLLOW	WHITEWARE	PAINTED	B	FLORAL	RED,GREEN,BLACK
278	CUP	WHITEWARE	PAINTED	B	FOLIATE	BLUE
282	FLAT	WHITEWARE	PAINTED	B	FOLIATE	GREEN,BLACK,RED
285	FLAT	WHITEWARE	PAINTED	D	FOLIATE	BLUE
286	FLAT	WHITEWARE	PAINTED	D	FOLIATE	BLUE
289	FLAT	WHITEWARE	PAINTED	C	FOLIATE	BLUE
291	FLAT	WHITEWARE	SPONGED	B		RED.BLUE
294	FLAT	WHITEWARE	SPONGED	B		PURPLE.BLUE
301	HOLLOW	WHITEWARE	SPONGED	B		GREEN.RED
305	HOLLOW	WHITEWARE	SPONGED	B		GREEN
306	FLAT	WHITEWARE	SPONGED	B		GREEN
309	CUP	WHITEWARE	PAINTED	E	FLORAL	RED

TABLE 67 (Continued).

VESSEL NUMBER	FORM	WARE	DECORATION	CLASS	MOTIF	COLOR
310	FLAT	WHITEWARE	PAINTED	B	FLORAL	PINK,BLUE,GREEN
312	FLAT	WHITEWARE	PAINTED	B	FLORAL	GREEN,RED,BLACK,BLUE
313	FLAT	WHITEWARE	PAINTED	B	FLORAL	GREEN,RED,BLACK,BLUE
318	BOWL	WHITEWARE	PAINTED	B	BANDED	BLACK
335	HOLLOW	WHITEWARE	PAINTED	B	FOLIATE	GREEN,BLACK
336	BOWL	WHITEWARE	PAINTED	C	FLORAL	RED,GREEN,BLACK
338	SALT	WHITEWARE	PAINTED	E	?	BLUE
339	HOLLOW	WHITEWARE	PAINTED	E	FLORAL	RED,BLUE,GREEN,BLACK
341	?	WHITEWARE	PAINTED	E	FOLIATE	GREEN
344	PLATE	WHITEWARE	PAINTED	E	FLORAL	RED,BLUE,GREEN,BLACK
348	CUP	WHITEWARE	PAINTED	B	BANDED	RED
351	HOLLOW	WHITEWARE	PAINTED	E	FOLIATE	BLUE
353	FLAT	WHITEWARE	PAINTED	B	BANDED	BLUE
354	HOLLOW	WHITEWARE	PAINTED	B	FLORAL	BLUE
355	HOLLOW	WHITEWARE	PAINTED	B	FLORAL	BLUE
358	HOLLOW	WHITEWARE	PAINTED	E	BANDED	BLUE
361	FLAT	WHITEWARE	PAINTED	B	FOLIATE	BLUE
365	PLATE	WHITEWARE	PAINTED	D	FLORAL	BLUE
367	PLATE	WHITEWARE	PAINTED	B	FLORAL	BLUE
373	CUP	WHITEWARE	PAINTED	B.	BANDED	BLUE
377	PLATE	WHITEWARE	EDGED	B	REGULAR SCALLOPED.BUD	GREEN
378	PLATE	WHITEWARE	EDGED	B	REGULAR SCALLOPED,BUD	GREEN
384	PLATE	WHITEWARE	EDGED	B	REGULAR SCALLOPED,BUD	BLUE
386	PLATE	WHITEWARE	EDGED	B	REGULAR SCALLOPED,BUD	BLUE
388	PLATE	WHITEWARE	EDGED	B	SCALLOPED,BUD	BLUE
390	PLATE	WHITEWARE	EDGED	B	REGULAR SCALLOPED,BUD	BLUE
392	PLATE/PLATTER	WHITEWARE	EDGED	B	UNSCALLOPED,OCTAGANOL	BLUE
395	PLATE	WHITEWARE	EDGED	B	IRREGULAR SCALLOPED,BUD	BLUE
397	PLATE	WHITEWARE	EDGED	B	REGULAR SCALLOPED	BLUE
399	PLATE	WHITEWARE	EDGED	B	REGULAR SCALLOPED,BUD	BLUE
400	PLATE	WHITEWARE	EDGED	B	REGULAR SCALLOPED,BUD	BLUE
401	PLATE	WHITEWARE	EDGED	B	REGULAR SCALLOPED,BUD	BLUE
402	PLATE	WHITEWARE	EDGED	B		BLUE
403	PLATE	WHITEWARE	EDGED	B	REGULAR SCALLOPED.BUD	BLUE
404	PLATE	WHITEWARE	EDGED	B	REGULAR SCALLOPED,BUD	BLUE
409	PLATE	WHITEWARE	EDGED	B	REGULAR SCALLOPED,BUD	BLUE
410	PLATE	WHITEWARE	EDGED	B	UNSCALLOPED	BLUE
418	PLATE	WHITEWARE	EDGED	B	REGULAR SCALLOPED,BUD	BLUE
428	PLATE	WHITEWARE	EDGED	B	IRREGULAR SCALLOPED,BUD	BLUE
432	PLATE	WHITEWARE	EDGED	B	REGULAR SCALLOPED.BUD	BLUE
435	PLATE	WHITEWARE	EDGED	B	REGULAR SCALLOPED.BUD	BLUE
441	PLATE	WHITEWARE	EDGED	B	REGULAR SCALLOPED.BUD	BLUE
443	PLATE	WHITEWARE	EDGED	B	REGULAR SCALLOPED.BUD	BLUE
444	PLATE	WHITEWARE	EDGED	B	IRREGULAR SCALLOPED,BUD	BLUE
451	PLATE	WHITEWARE	EDGED	B	IRREGULAR SCALLOPED.BUD	BLUE
454	PLATTER	WHITEWARE	EDGED	B	REGULAR SCALLOPED,BUD	BLUE
456	PLATE	WHITEWARE	EDGED	B	REGULAR SCALLOPED.BUD	BLUE
457	PLATE	WHITEWARE	EDGED	B	SCALLOPED ?	BLUE

APPENDIX XII

QUALIFICATIONS OF INVESTIGATORS

APPENDIX XII
QUALIFICATIONS OF INVESTIGATORS

Silas D. Hurry

B.A. in Anthropology and B.A. in History, St. Mary's College, Maryland. Fifteen years of experience in historic archeology.

Maureen Kavanagh

M.A. in Anthropology, University of Wisconsin-Madison. Nine years of experience in the archeology of the Middle Atlantic region.

Lori A. Frye

M.A. in Historic Preservation, Western Kentucky University. Nine years of experience in archeology.

Hettie Ballweber

B.A. in Anthropology, California University of Pennsylvania, California, Pennsylvania. M.A.A. candidate, University of Maryland, College Park. Six years of experience in archeology.

Jennifer Chapman

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B.S. in Natural Science, The Johns Hopkins University, Baltimore, Maryland. Three years of experience in archeology.

Spencer O. Geasey

Over thirty years of experience in Maryland archeology.

Janet Gillis

B.A. candidate in Archeology, University of Maryland, Baltimore County. No previous experience in field archeology.

Jonathan Greene

A.A. in Archeology and Art, Community College of Baltimore. Two years of experience in field archeology.

Alison Helms

B.A. in Geology, Oberlin College, Ohio. Three years of experience in archeology.

William Huser

B.A. in Anthropology, Indiana University. Eight years of experience in archeology.

Betty Leigh Hutcheson

B.A. in Anthropology, University of Florida, Gainsville. Four years of experience in archeology.

Camille Juliana

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Ronald G. Orr

B.A. in Anthropology from American University. M.A. in Environmental Biology from Hood College. Twelve years experience in archeology.

Timothy Sara

B.A. in Anthropology, SUNY Binghamton. Two years of experience in archeology.